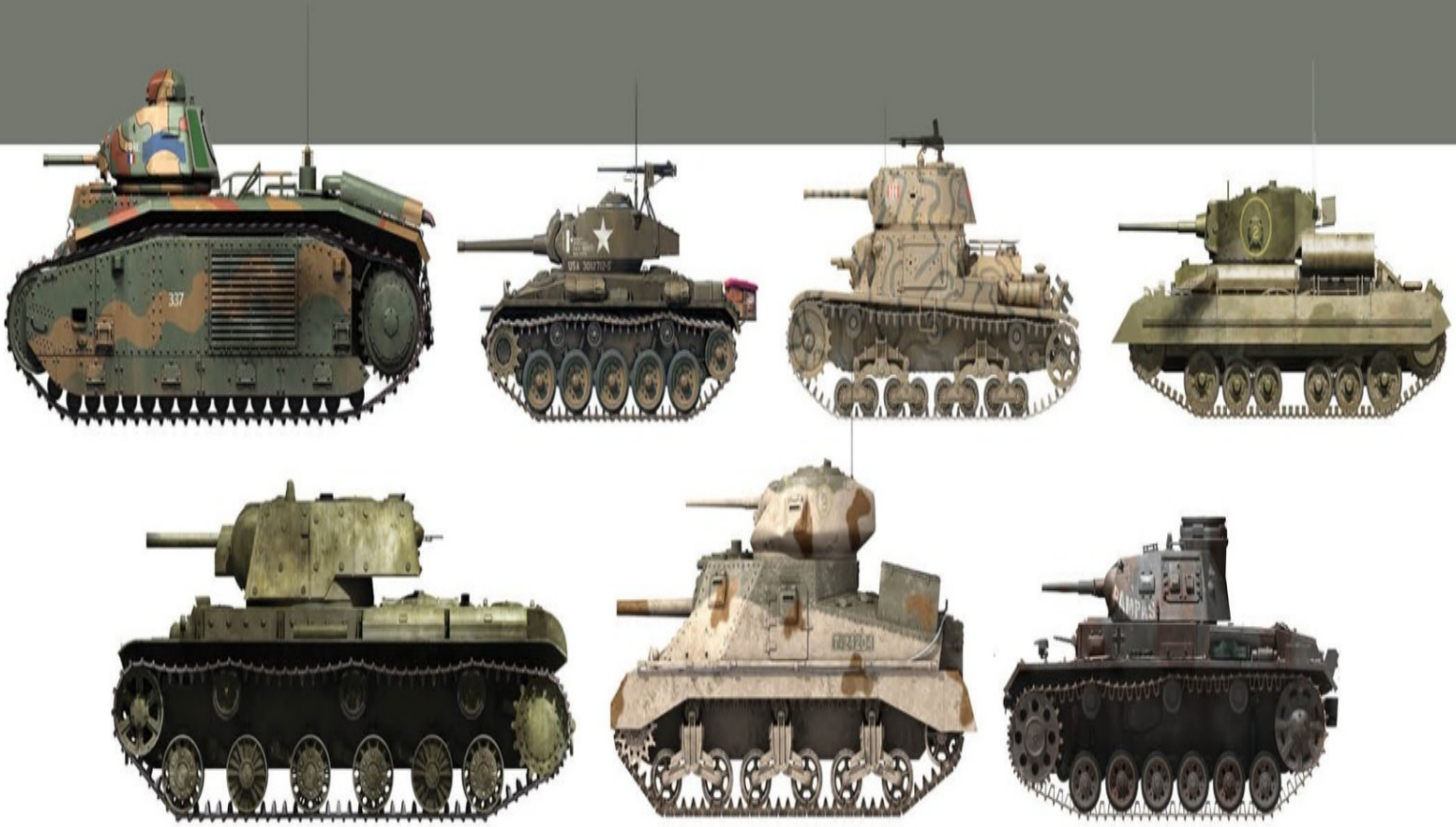

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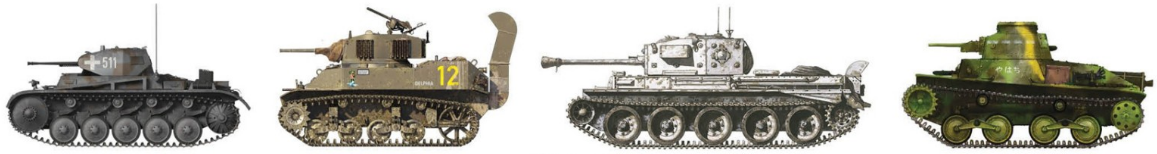

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Compiled by Chris McNab

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CHRONOLOGY

1939	
1 Sept.	Germany invades Poland.
3 Sept.	Britain and France declare war on Germany.
1940	
9 Apr.	Germany invades Denmark and Norway.
10 May	Germany invades France and Low Countries.
10–28 May	Battle of Belgium.
26 May–4 June	Allied troops withdraw from Dunkirk.
22 June	France surrenders.
3–5 July	Battle of Mers-el-Kebir.
10 July–31 Oct.	Battle of Britain.
28 Oct.	Italy invades Greece.
1941	
28 Mar.	Battle of Cape Matapan.
6 Apr.	Germany invades Greece and Yugoslavia.
20 May	German airborne invasion of Crete.
27 May	Bismarck sunk by the British.
22 June–5 Dec.	Operation *Barbarossa*, Axis invasion of Soviet Union.
19 Sept.–27 Jan. 1944	Siege of Leningrad.
2 Oct.–7 Jan. 1942	Battle of Moscow.
30 Oct.–4 July 1942	Siege of Sevastopol.
7 Dec.	Japan attacks Pearl Harbor.
8 Dec.	Siege of Tobruk raised.
8 Dec.–31 Jan 1942	Malayan campaign fought.
11 Dec.	Germany declares war on the US.
14 Dec.	Japanese start invasion of Burma.
17 Dec.	First Battle of Sirte.
1942	
27 Feb.	Naval battle of Java Sea.
22 Mar.	Second Battle of Sirte.
5–8 May	Battle of the Coral Sea.
12–28 May	Second Battle of Kharkov.
26 May–21 June	Battle of Gazala.

4–7 June	Battle of Midway.
1–27 July	First Battle of El Alamein.
July–Feb. 1943	Battle of Guadalcanal.
8–9 Aug.	Naval battle of Savo Island.
23 Aug.–2 Feb. 1943	Battle of Stalingrad.
23 Oct.–11 Nov.	Second Battle of El Alamein.
8 Nov.	Operation *Torch*, Anglo-American invasion of Vichy French North Africa.
12–15 Nov.	Naval battle of Guadalcanal.
17 Nov.–9 May 1943	Battle for Tunisia.
1943	
14–22 Feb.	Battle of Kasserine Pass, Tunisia.
2–4 Mar.	Battle of the Bismarck Sea.
10 July	Operation *Husky*, Allied invasion of Sicily.
12 July–23 Aug.	Battle of Kursk.
12 July	Germans lose Prokhorovka tank battle.
20 Nov.	American forces invade Makin and Tarawa.
1944	
17 Jan.–18 May	Battle of Monte Cassino.
31 Jan.	Americans invade Marshall Islands.
8 Mar.–3 July	Battle of Imphal.
6 June	D-Day: the Normandy landings.
10 June	Soviets start offensive against Finland.
15 June–9 July	Battle of Saipan.
19–20 June	Battle of the Philippine Sea.
19–30 June	Battle for Cherbourg, France.
23 June–29 Aug.	Soviet *Bagration* offensive.
21 July	Americans invade Guam.
1 Aug.–2 Oct.	The Warsaw Uprising.
15 Aug.	Operation *Dragoon*, Allied invasion of southern France.
Aug.	Romania, Bulgaria and Finland declare war on Germany.
17–25 Sept.	Allied Operation *Market-Garden*.
19 Sept.–16 Dec.	Battle of Hürtgen Forest.
21 Oct.	Fall of Aachen, Germany: Siegfried Line penetrated.
23–26 Oct.	Naval battle of Leyte Gulf.
4 Nov.	Greece completely liberated.
16 Dec.–25 Jan. 1945	Battle of the Bulge.
1945	
19 Feb.–26 Mar.	Battle of Iwo Jima.
1 Apr.–22 June	Battle of Okinawa.
16 Apr.–2 May	Battle of Berlin.

28 Apr.	Mussolini captured and executed by partisans.
30 Apr.	Hitler commits suicide.
2 May	Berlin garrison and German forces in Italy surrender; formal end to war in the Mediterranean.
7 Aug.	Atomic bomb dropped on Hiroshima.
8 Aug.	Soviet Union declares war on Japan.
9 Aug.	Atomic bomb dropped on Nagasaki.
14 Aug.	Unconditional surrender of Japanese forces.
15 Aug.	VJ-Day; all offensive action against Japan ends.

THE CHAR B1 BIS

Although the Char B1 bis was the most powerful tank on the 1940 battlefield, in some respects it was among the more archaic. It evolved from the Char B1, which bore a certain resemblance to British Landships of World War I, with flat plate tracks running around the entire length and height of the hull. The main gun in the hull was a short 75mm weapon developed by Ateliers de Bourges (ABS) from the Mle. 31 fortress gun. It was primarily intended for attacking field works, bunkers and other targets because tank-versus-tank fighting in World War I had been so rare; indeed, there were no known instances of French tanks encountering German tanks in 1917–18. The 75mm gun, however, was poorly suited to tank fighting due to its location and peculiar traverse system. Instead of using a dedicated gunner, the gun was traversed in azimuth using the sophisticated Naeder hydrostatic driving controls and aimed using a stereoscopic sight by the driver. While technically clever, this overly complicated configuration proved most unfortunate in actual service use.

The Char B1 went into production in small numbers from 1934, but its design revealed numerous defects, and so rather than continue production, the upgraded Char B1 bis was developed. The main armour was increased from 40mm (1.57in) to 60mm (2.36in), and the turret armour was also increased to 60mm (2.36in). The original APX1 turret with the short 47mm SA 34 gun was replaced by the APX4 turret with the longer 47mm SA 35, which was better suited to tank fighting. The heavier armour led to a redesign of the engine to increase power from 200 to 300 horsepower by adding a second carburettor, but this came at the expense of endurance, which fell from eight hours to five hours between refuelling.

An initial production order for 35 Char B1 bis tanks, enough to equip a single battalion, was signed in October 1936. By the time of the war’s outbreak on 1 September 1939, a total of 35 Char B1 and 84 Char B1 bis had been delivered, and a total of 350 were on order.

SPECIFICATIONS

Crew: 4

Weight: 31.5 tonnes (34.8 tons)

Power-to-weight ratio: 9.5hp/ton

Overall length: 6.37m (20.92ft)

Overall width: 2.5m (8.2ft)

Overall height: 2.79m (9.15ft)

Ground pressure: 13.9kg/cm^2(198psi)

Ground clearance: 0.48m (1.57ft)

Engine: Renault 6-cylinder, 307hp at 1,900rpm, petrol

Transmission: 5 forward, 1 reverse

Fuel capacity: 400 litres (106 gallons)

Max. speed: 28km/h (17.4mph)

Max. range: 95–180km (59–112 miles)

Trench-crossing capability: 2.75m (9.02ft)

Armour: 60mm (2.36in) hull front; 55mm (2.17in) hull sides; 50mm (1.97in) hull rear; 56mm (2.2in) turret sides; 30mm (1.18in) turret roof

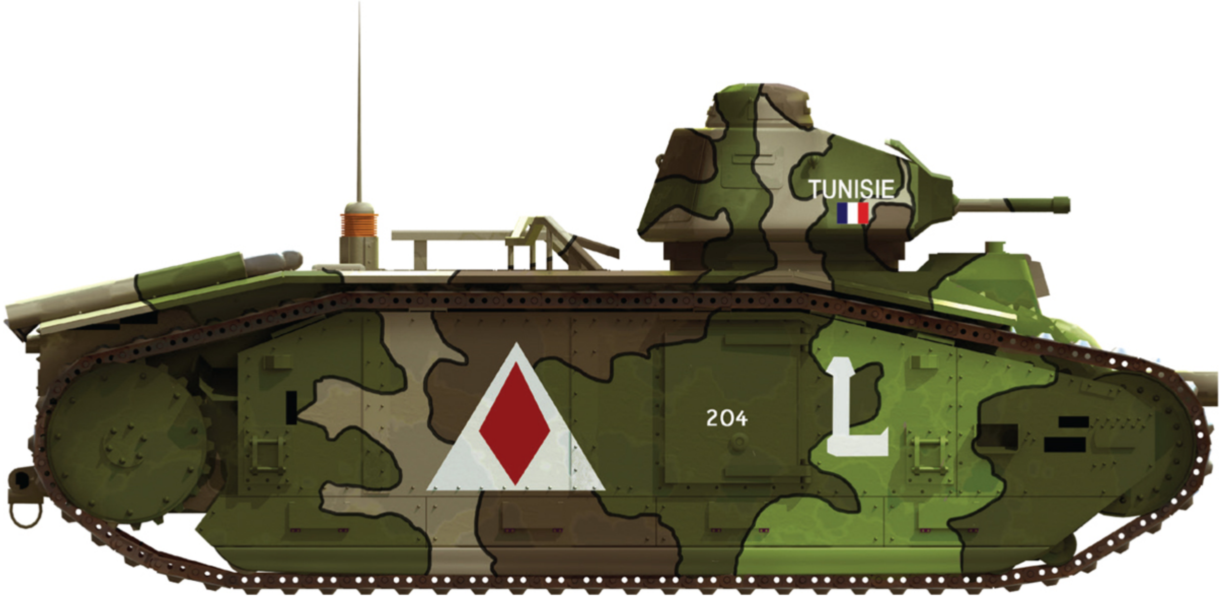
Main armament: 75mm SA 35 infantry support gun; 47mm SA 35 anti-tank gun

Secondary armament: 2 × MAC 31E 7.5mm machine guns with 5,250 rounds

Stowed main gun rounds: 74 × 75mm shells; 50 × 47mm shells

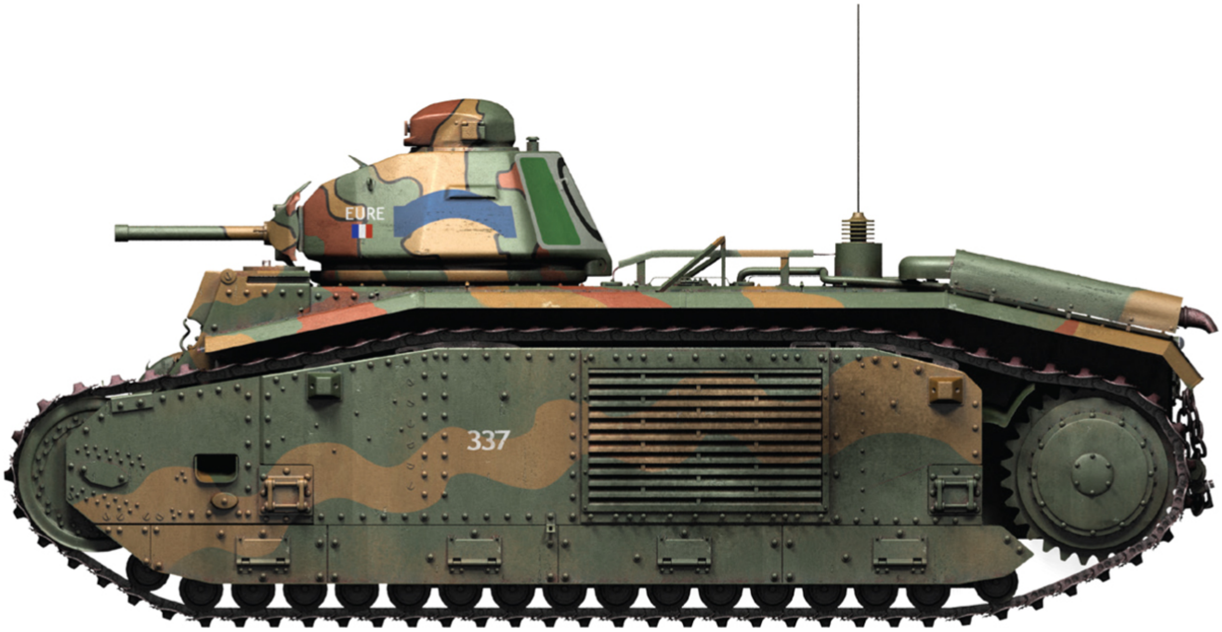
Stowed machine gun rounds: 5,250

TANK DETAILS



CHAR B1 BIS, FRANCE, 1939

The Char B1 bis had some of the most eclectic camouflage schemes, since the tank was produced at five facilities: Renault, FCM, FAMH (Saint-Chamond), AMX (Satory) and Schneider (Atelier du Creusot). Each of the plants tended to have their own interpretation of French camouflage patterns. To add to the mixture, the turret was supplied separately, and the pattern sometimes differed from that of the hull. ‘Tunisie’ (no. 204) was built under the 8 October 1936 contract and delivered in mid-1937.



CHAR B1 BIS, MAY 1940

By the time of the German attack on 10 May 1940, 258 Char B1 bis had been delivered to eight battalions, including the 41e. This tank, ‘Eure’, was commanded by Captain Pierre Billotte of the 1e Compagnie. The tempo of production of the Char B1 bis increased from about seven per month in 1939 to about 32 per month in 1940, and by the end of the campaign, 1,178 Char B1 bis had been ordered and 403 completed by Renault, FCM, FAMH, AMX and Schneider.

THE SOMUA S 35

In the first half of the 1930s, Somua was encouraged to offer a cavalry tank design for an Automitrailleuse de Combat (AMC) requirement, submitting a design in October 1934. The AC 3 pilot was delivered in April 1935, minus the turret, which was under development by APX. The tank made extensive use of large armour castings for its hull and had an armour basis of 40mm (1.57in), which was judged sufficient to withstand the new German 37mm anti-tank gun at typical combat ranges. A second pilot tank was delivered in 1935, featuring a temporary mounting for an APX 1 turret. Tests on this version were conducted from July 1936 to March 1937, revealing the need for a new engine, wider tracks and better hull ventilation. The Somua design ultimately proved so promising that an initial production contract for 50 was awarded in March 1936 for the definitive AC 4 design as the Char de Cavalerie 1935 S, more often known as the Somua S 35.

The definitive production tanks were fitted with the new APX 1CE turret, the CE indicating *chemin elargi* (enlarged turret ring). This turret was very similar in overall appearance to the APX 4 turret used on the Char B1 bis, but it had a wider turret ring. The intention behind this was to permit the use of a 'one-and-a-half man' turret crew. The tank commander sat inside the turret, but the turret ring was wide enough that the radio operator in the hull could stand up on the right side and assist the commander in loading the gun. Primary armament was a 47mm SA 35 semi-automatic tank gun with a length of L/32, aimed with a 4 × L 731 telescopic sight. The anti-armour penetration of the French 47mm anti-tank gun was similar to that of the German 3.7cm tank gun, which proved useful, albeit ultimately futile, in the Franco-German armoured battles of 1940.

SPECIFICATIONS

Crew: 3

Weight: 19.5 tonnes (21.5 tons)

Power-to-weight ratio: 9.7hp/ton

Overall length: 5.1m (17.73ft)

Overall width: 2.12m (6.96ft)

Overall height: 2.6m (8.53ft)

Ground pressure: 850g/cm^2 (12psi)

Ground clearance: 0.42m (1.37ft)

Engine: SOMUA V-8 12.666cc petrol, 190hp at 2,000rpm

Transmission: 5 forward, 1 reverse

Fuel capacity: 510 litres (134.5 gallons)

Max. speed (road): 45km/h (28mph)

Max. speed (off-road): 32km/h (19.8mph)

Max. range: 230km (143 miles)

Trench-crossing capability: 2.75m (9ft)

Fording capability: 0.9m (2.95ft)

Vertical step: 0.6m (1.97ft)

Armour: 47mm (1.85in) hull front; 42mm (1.65in) turret front; 40mm (1.57in) hull sides and turret sides; 20mm (0.79in) top

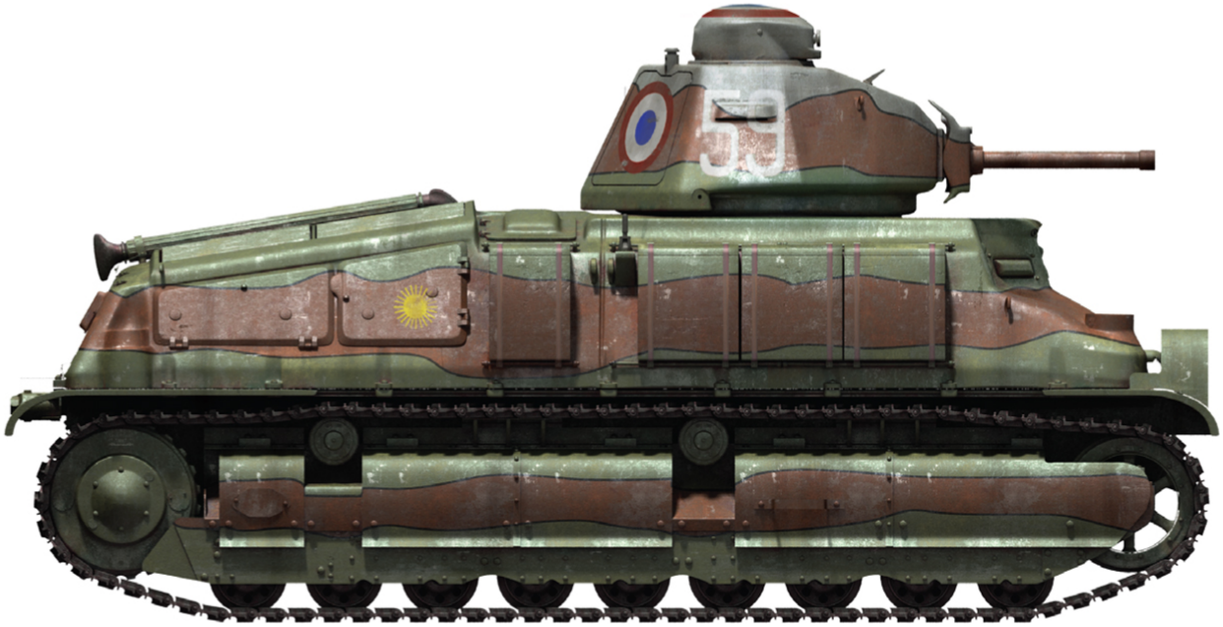
Main armament: 47mm SA35 L/32 gun

Secondary armament: 7.5mm Mitrailleuse mle 1931 optionally co-axial

Stowed main gun rounds: 121

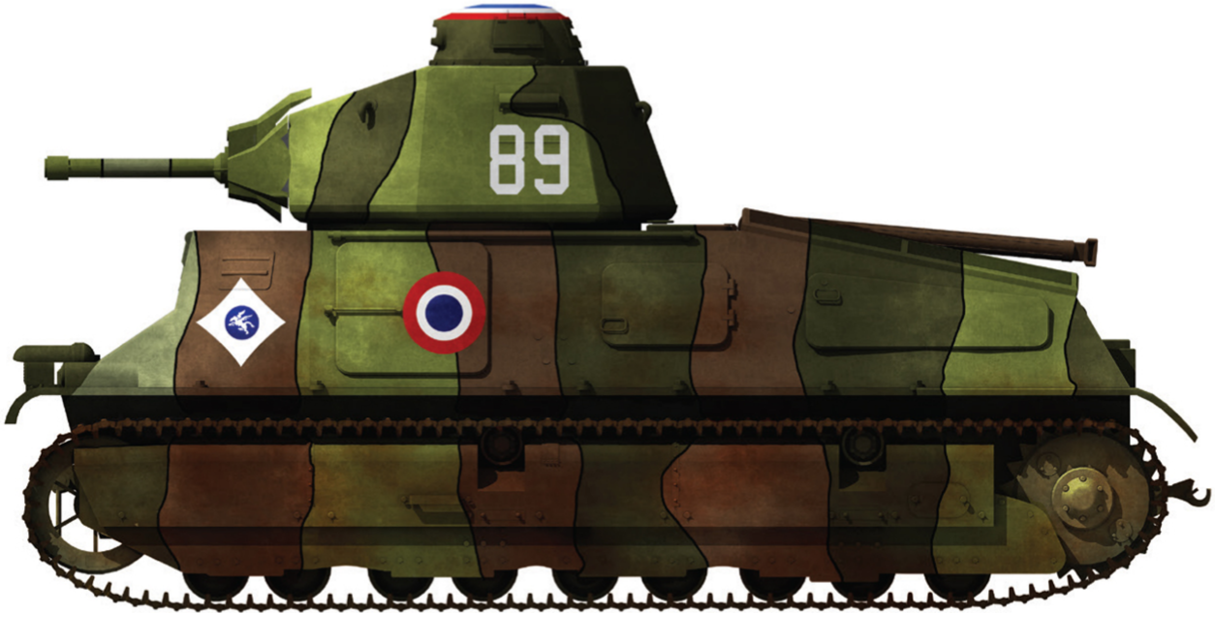
Stowed machine-gun rounds: 2,250

TANK DETAILS



SOMUA S 35, 2E CUIRASSIERS, 1940

The 2e Régiment de Cuirassiers was one of France’s oldest cavalry regiments, tracing its history back to 1635 and the Thirty Years War. The 1er Groupe d’Escadrons contained both Somua squadrons, the 1er Escadron under Capitaine de Beaufort, and the 2e Escadron of Capitaine Hardoin. Each squadron had four troops (*pelotons*), each with five Somua tanks. The Somua crews in May 1940, however, had limited training due to the late arrival of their S 35 tanks.



SOMUA S35, BELGIUM, 1940

This tank follows the colouring style of the initial batch of S 35s, which had horizontal bands of army green and earth brown with a band of light blue-grey on top. The S 35 tanks of the 2e Régiment de Cuirassiers seen here were in the regiment’s first two squadrons, so were numbered around 50–73; this was carried on the side and repeated on the left rear turret panel. The regiment sometimes used the emblem of the Sun King, Louis XIV, on the hull side, based on the regimental insignia.

THE HOTCHKISS H39

In the late 1930s, Hotchkiss attempted to improve the unsatisfactory design of its H35 cavalry tank design with a thorough modernization effort that culminated in the H39 in 1938. This version substituted a more powerful 120hp engine, which increased maximum speed from 28km/h (17mph) to 36km/h (23mph), but reduced the range from 150km (93 miles) to 120km (75 miles). The H35 suspension was prone to losing the rubber from its road wheels, so the modified suspension used steel-rimmed wheels. To accommodate the added weight, the tracks were widened from 25 to 27cm (9.8 to 10.6in). Hotchkiss referred to the new version as Char Léger mle. 1938 series D, sometimes abbreviated as 38H. This designation was not adopted by the army, which called it the Char Léger mle 1935 H modifié 1939 or H39. An initial contract for 400 H39 tanks was awarded in July 1938, with about half going to the cavalry. The first batch of H39 tanks was delivered in February 1939, though without guns or armament. At the start of the war in September 1939, no H39s had been delivered to the cavalry. A total of 680 H39s had been delivered by the end of May 1940, and 703 had been completed at the factory by 1 June 1940.

The 37mm SA18 gun on the Hotchkiss had been based on infantry requirements. The Spanish Civil War had revealed the need for tanks to be able to fight other tanks, and this led to the development of the long 37mm SA38 gun, which entered production at the end of 1939. This was mounted on H39 tanks starting around no. 480. Due to lingering shortages, they were issued on a scale of one long 37mm gun per three cavalry tanks and one per every four infantry tanks. By April 1940, 358 of the new guns had been completed, and a total of about 800 were completed by the end of the 1940 campaign.

Both the H35 and the H39 fared poorly in the battles of 1940 in France. The tanks themselves were sound in comparison to contemporary German models, but collapsing French tactics meant that the French tank formations were spread out and frequently cut off from communications, or ran out of fuel and had to be abandoned.

SPECIFICATIONS

Crew: 2

Weight: 12.1 tonnes (13.3 tons)

Power-to-weight ratio: 10hp/ton

Overall length: 4.22m (13.8ft)

Overall width: 1.95m (6.4ft)

Overall height: 2.13m (7ft)

Ground pressure: 0.9kg/cm^2 (12.8psi)

Engine: Hotchkiss 8-cylinder inline 6l, 120bhp

Transmission: 5 forward, 1 reverse

Fuel capacity: 205 litres (55 gallons)

Max. speed (road): 36.5km/h (22.7mph)

Max. range: 120km (75 miles)

Trench-crossing capability: 1.8m (5.9ft)

Armour: 40mm (1.57in) hull front and sides; 18mm (0.71in) hull top; 20mm (0.79in) hull floor; 45mm (1.77in) turret

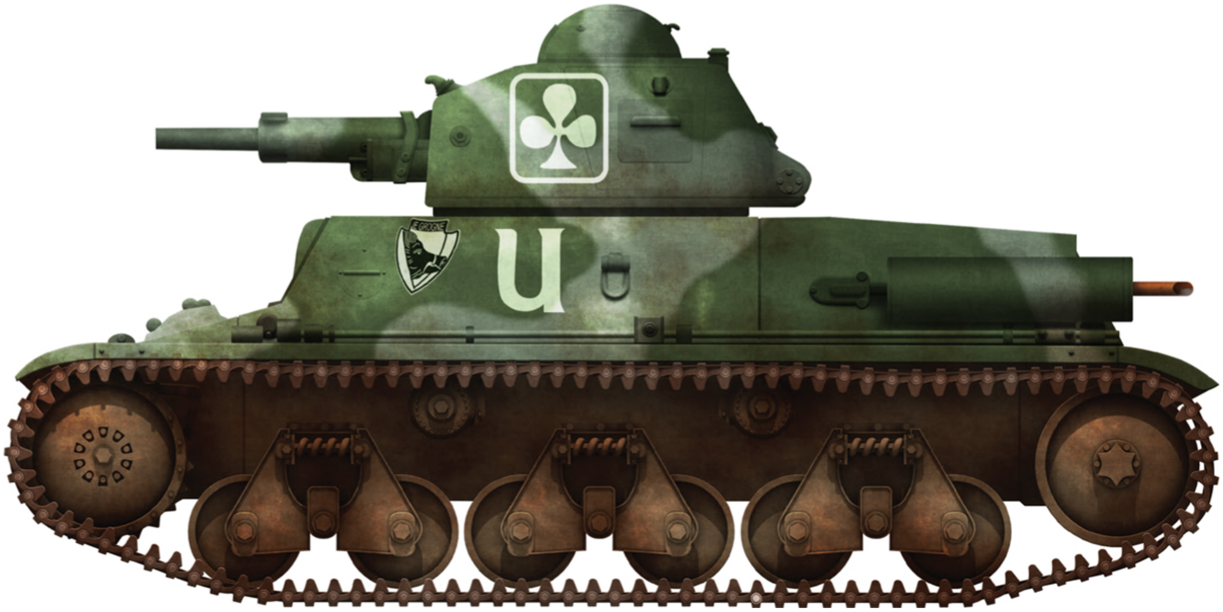
Main armament: 37mm SA18 L/21 or SA38 L/33 main gun

Secondary armament: 1 × 7.5mm MAC 1931 Reibel machine gun

Stowed main gun rounds: 120

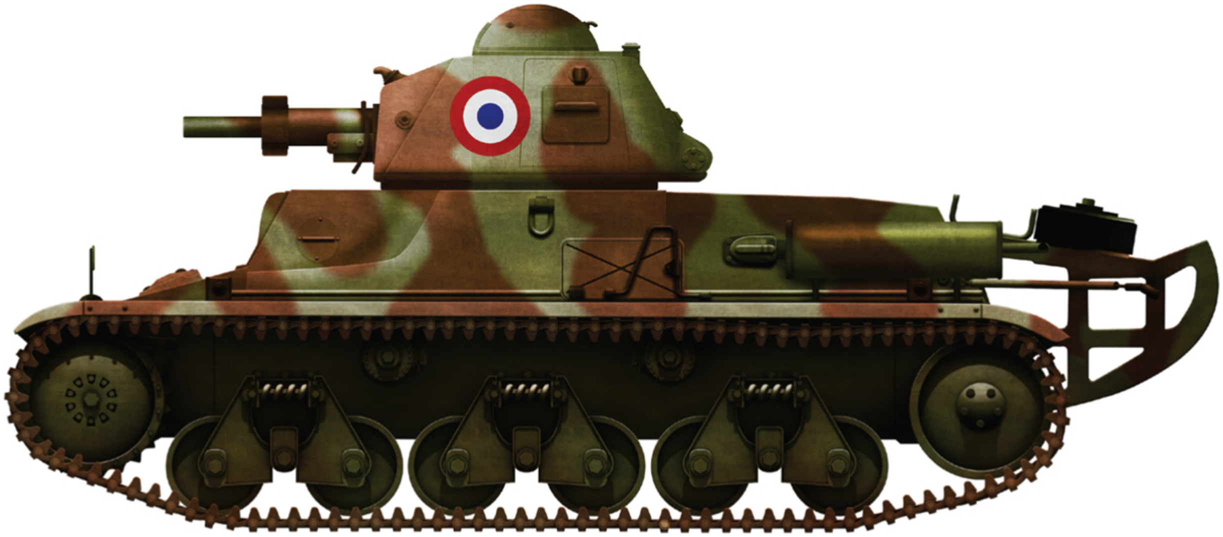
Stowed machine gun rounds: 2,400

TANK DETAILS



HOTCHKISS H39, MAY 1940

The tanks of the 26e Bataillon de Chars de Combat used a common playing card symbol, but in a square with rounded corners. This was carried on either side of the turret and on the upper right corner of the rear. The 2e Compagnie used a large letter on the hull side to identify section commanders, in this case the 4e section, ‘u’. A few of the battalion’s tanks, such as this one, had the battalion insignia painted on them: a boar’s head on a shield with the phrase ‘*Je grogne*’ (‘I growl’).



HOTCHKISS H39, 8E DRAGONS, 1940

The 8e Régiment des Dragons suffered heavy losses during the fighting in Belgium. The remnants of the division were used to form the core of the newly constituted 7e Division Légère Mécanique, equipped with H39 tanks, including the latest production version with the 37mm SA38 gun and unditching tail, such as this one. Given the hasty formation, markings were minimal, consisting of the usual two-tone army green/earth brown camouflage, and numerous national cocarde insignia due to the problem of fratricide.

THE PANZER I

In spite of the restrictions of the Versailles Treaty, Germany had begun to work on tanks in the late 1920s. Authorities recognized that the new Panzer divisions would require thousands of tanks, and this manufacturing feat could not be accomplished with large and expensive designs. Furthermore, German industry was not yet ready to produce large tanks. Instead, Krupp was contracted to design a much smaller and less expensive light tank, which emerged in 1934 as the Panzerkampfwagen I.

The initial PzKpfw I Ausf. A weighed 5.4 tonnes (5.96 tons) and was armed with two 7.92mm machine guns. It had a two-man crew: a driver and gunner/commander. The armour basis was 13mm (0.51in), enough to protect against rifle fire. In later years, the PzKpfw I was misleadingly characterized as a mere 'training tank'. This was certainly not the case. By early 1930s standards, it was an efficient and well-armed design. It should be recalled that at this time, tankettes made up the bulk of tank production in most of Europe, for example the Italian L3, Polish TK and Soviet T-27. The PzKpfw I fitted comfortably into the German tank doctrine of the time as summarized in a 1936 report: 'The classical role for tanks is to overcome machine guns that have dominated the battlefield, while at the same time crossing terrain obstructions. Therefore, the three primary features of the tank are protection against machine gun fire, armament of machine guns and cannon to engage targets, and high cross-country mobility with the capability to cross trenches and barbed wire.'

Production of the PzKpfw I Ausf. A continued until June 1936, by which time 818 had been manufactured. Production of the PzKpfw I Ausf. B began in August 1935. This improved version used a lengthened hull and suspension with an uprated engine. A total of 675 were manufactured through June 1937. A number of subvariants were manufactured, of which the most significant was the Kleiner

Panzerbefehlswagen, a dedicated command tank fitted with FuG 2 and FuG 6 radios. These were based primarily on the lengthened chassis, and a total of 184 were manufactured through 1937.

SPECIFICATIONS

Crew: 2

Weight: 5.8 tonnes (6.39 tons)

Power-to-weight ratio: 17.2hp/ton

Overall length: 4.42m (14.5ft)

Overall width: 2.06m (6.76ft)

Overall height: 1.72m (5.64ft)

Ground pressure: 0.52kg/cm^2(7.39psi)

Ground clearance: 0.3m (0.98ft)

Engine: Maybach NL 38 TR petrol 100hp at 3,000rpm

Transmission: 5 forward, 1 reverse

Fuel capacity: 140 litres (37 gallons)

Max. speed (road): 37km/h (23mph)

Max. speed (off-road): 12km/h (7.5mph)

Max. range: 140km (87 miles) road; 115km (71.5 miles) off-road

Trench-crossing capability: 1.4m (4.6ft)

Fording capability: 0.58m (1.9ft)

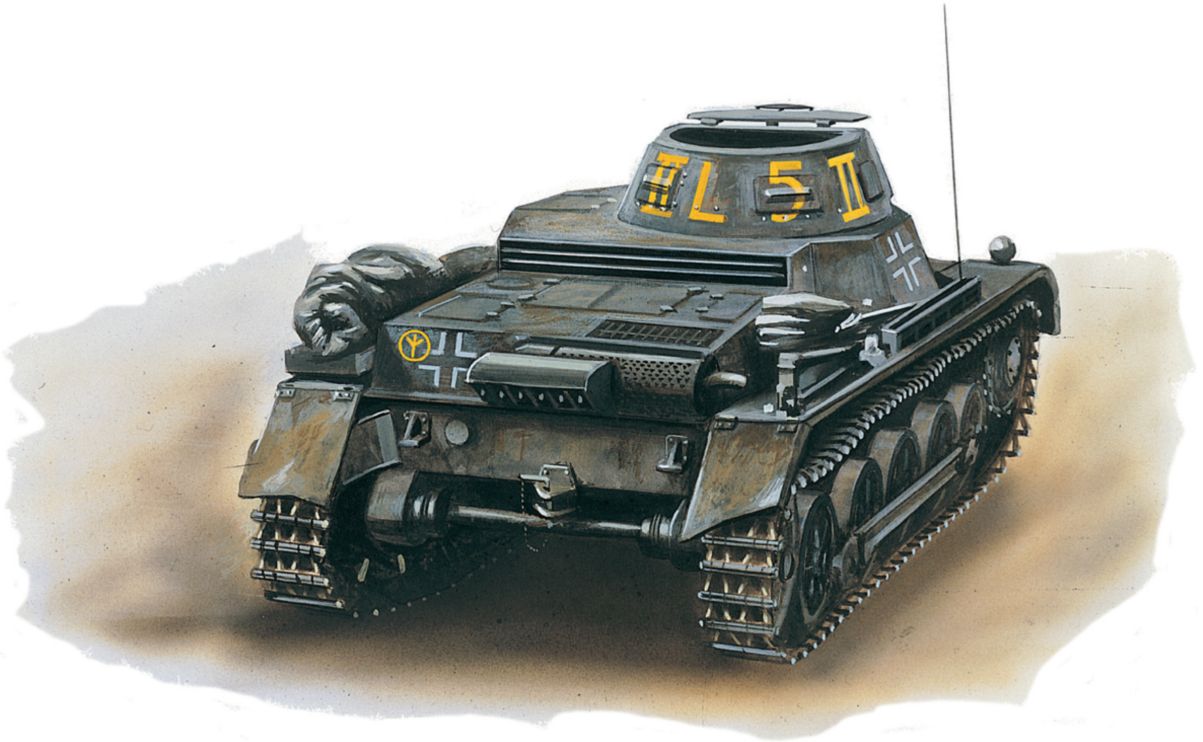
Vertical step: 0.36m (1.18ft)

Armour: 15mm (0.59in) MG mount; 13mm (0.51in) turret and hull sides; 8mm (0.31in) rear engine deck

Main armament: 2 × 7.92 mm MG13

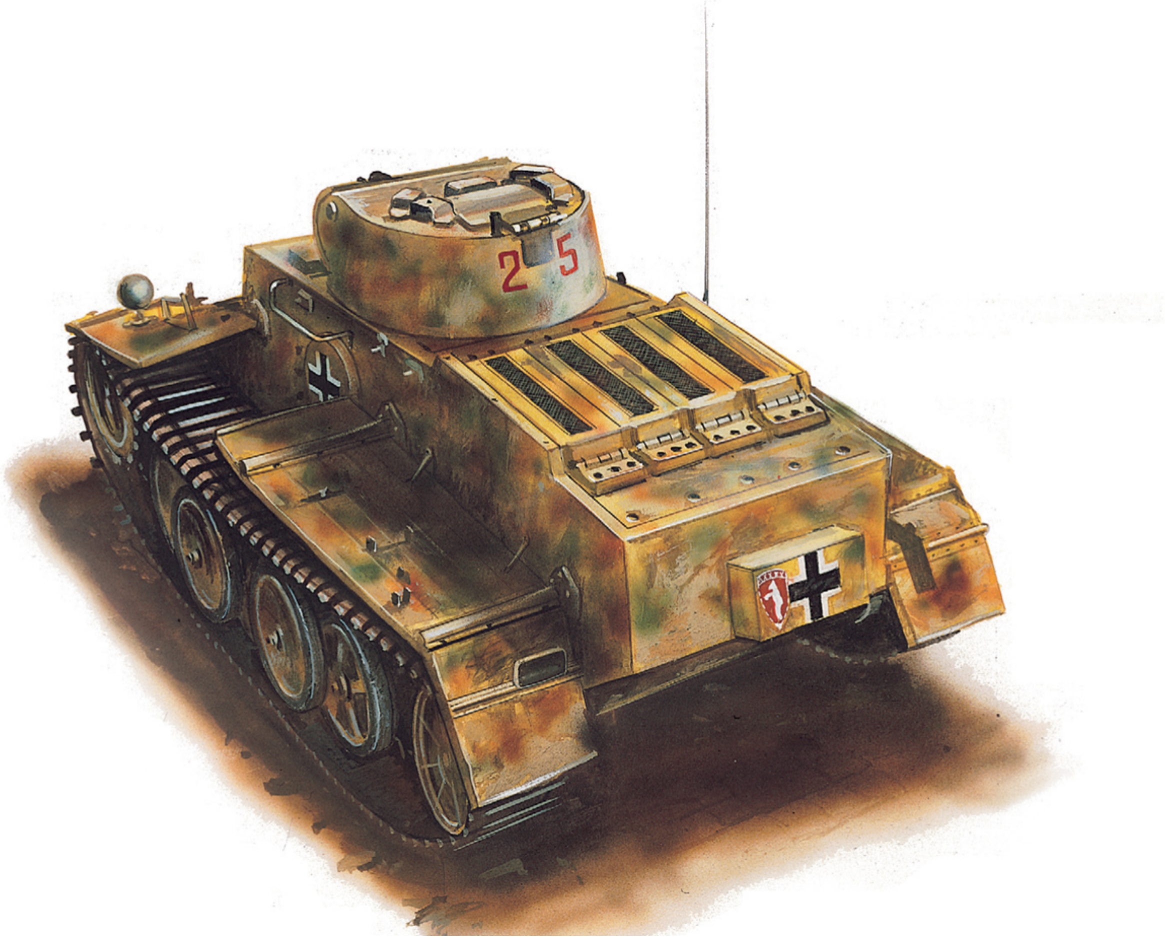
Stowed machine gun rounds: 2,250

TANK DETAILS



PZKPFW I AUSF. B, FRANCE, 1940

The turret codes ‘IIL’ indicate that the 2. Bataillon of the 4. Panzer-Division was a ‘light’ battalion; ‘5’ is the individual tank number. Note that these, and the 1940 version of the divisional insignia, are in yellow, while the national cross is in white outline only on the Panzer grey background. The battalion HQ Roman ‘II’ was repeated on both turret sides as well as the rear.



PZKPFW I AUSF. F, RUSSIA, 1943

The ‘PzKpfw I nA verst’ born of the VK 1801 prototype was built in only 30 examples and issued as the ‘PzKpfw I Ausf. F’. This very heavily armoured infantry support vehicle bore little resemblance to the other PzKpfw I models. The trials unit served in Russia in 1943 with 1. Panzer-Division, where this tank, ‘red 25’, was captured. The tactical number was painted on the turret rear only; and the use of the ‘Berlin bear’ motif, normally associated with 3. Panzer-Division, is unexplained.

THE PANZER II

The decision to proceed with production of the PzKpfw II was largely due to the need for more tanks to fill out the increasing number of German Panzer divisions. As the scale of tank production multiplied in Europe in the mid-1930s, the Wehrmacht sought a light tank capable of engaging enemy armour. This resulted in the PzKpfw II tank, which entered service in 1936. It was armed with a KwK 30 20mm automatic cannon as well as a single 7.92mm machine gun. The main gun could penetrate 14mm (0.55in) of armour angled at 30 degrees at 500m (547yds), and 20mm (0.79in) of armour at 100m (109yds). This was barely adequate when compared with other light tanks of the period, such as the Soviet T-26 with 15mm (0.59in) armour.

The PzKpfw II underwent considerable evolution during its production run, but even by 1936 the German Army was beginning to have second thoughts about its lightly armoured, weakly armed PzKpfw I and PzKpfw II tanks. There were signs that France and the Soviet Union were adopting more powerful anti-tank guns and tanks with heavier armour. In March 1936, the Waffenamt released a study that acknowledged that ‘in the future, lightly armoured Panzers will be pinned down by heavy weapons’ fire, just as in the last war the infantry and cavalry were forced to ground and stymied by machine guns. Among the known enemy anti-tank weapons, the Waffenamt views the French 25mm Hotchkiss gun as the most important and dangerous at this time.’ The main reason for the continued production of light tanks was that the PzKpfw III was not yet mature enough for mass production, and there was a continuing demand for new tanks to fill out the new Panzer divisions.

The most serious problem of the PzKpfw II in combat was revealed during the 1939 campaign in Poland. The 15mm (0.6in) armour could be readily penetrated by the Polish 7.92mm anti-tank rifles, to say nothing of 37mm anti-tank guns. To reduce their vulnerability, a significant portion of the PzKpfw II force was upgraded with 20mm appliqués on the front of the hull and turret prior to the battle of France.

SPECIFICATIONS

Crew: 3

Combat weight: 8.9 tonnes (9.84 tons)

Power-to-weight ratio: 15.5hp/ton

Overall length: 4.81m (15.78ft)

Overall width: 2.22m (7.28ft)

Overall height: 1.99m (6.53ft)

Ground pressure: 0.62kg/cm^2 (8.8psi)

Ground clearance: 0.35m (1.1ft)

Engine: Maybach HL 62 TR 6-cylinder (water-cooled) 6-litre petrol

Transmission: Zahnradfabrik Aphon SSG 46 gearbox; 6 forward, 1 reverse

Fuel capacity: 170 litres (45 gallons)

Max. speed (road): 40km/h (25mph)

Max. speed (off-road): 15km/h (9mph)

Operational range: 190km (118 miles) road; 130km (81 miles) off-road

Trench-crossing capability: 1.7m (5.58ft)

Fording capability: 0.85m (2.79ft)

Vertical step: 0.42m (1.38ft)

Armour: 14.5mm (0.57in) glacis/hull/turret face

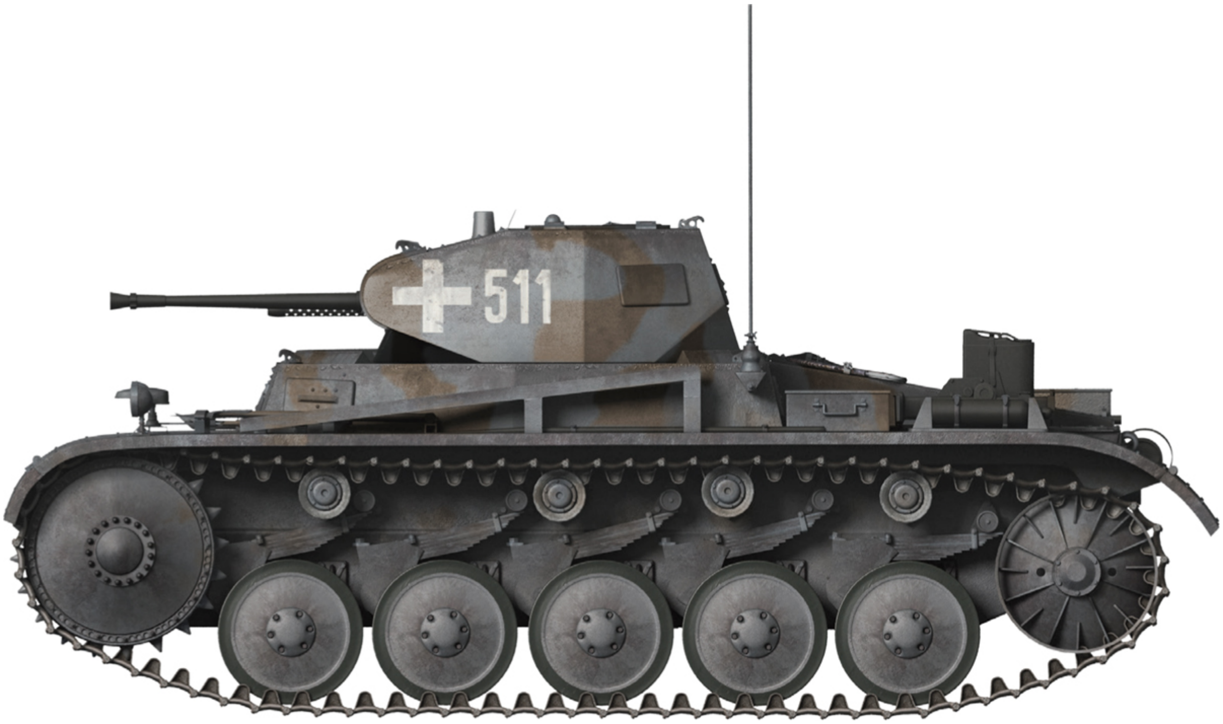
Main armament: 20mm KwK 30 L/55

Secondary armament: 7.92mm MG 34

Stowed main gun rounds: 180

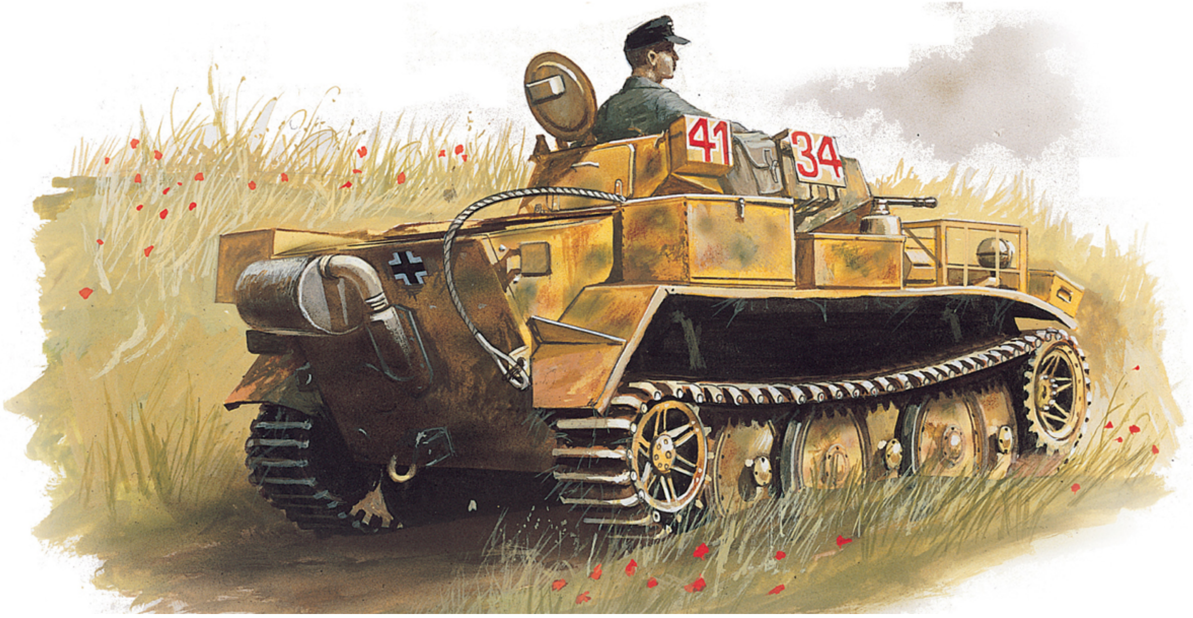
Stowed machine gun rounds: 1,425

TANK DETAILS



PZKPFW II AUSF. C, PANZER-REGIMENT 35, 1939

The PzKpfw II’s interior was ivory (RAL 1001) over a red primer, while the exterior sported a two-tone scheme of dark grey (RAL 46, later renumbered RAL 7021) as a base coat. Over this, irregular patches of dark brown (RAL 45, later renumbered RAL 7017) were spray-painted onto roughly one-third of the surface. Vehicle identification generally comprised three digits applied to each turret side, indicating the company and platoon to which the tank belonged, and its individual number.



PZKPFW II AUSF. L 'LUCHS', NORMANDY, 1944

The 'Luchs' was a light reconnaissance variant with overlapping/interleaved road wheels and 'slack track' configuration. The heavy modification and stowage of this model left little room for displaying markings. Finished in overall factory dark yellow with a random oversprayed mottle of dark green and red-brown, this tank served with an as-yet-unidentified reconnaissance unit in Normandy – the four-digit tactical number '4134' is split into two pairs.

THE PANZER III

The Panzer III was the first German medium tank and as such equipped the Panzer divisions of the Wehrmacht from the early days of blitzkrieg in 1939 and 1940, through the invasion of the Soviet Union in 1941 and the great tank battles of 1943, from which point it began to be removed from front-line service in favour of the Panzer IV and Panther.

Its development started in 1935 because of a request for a tank large enough to mount a 50mm gun. However, the availability of a 37mm gun already in production meant that this was the weapon adopted, with the tank designed to accommodate an upgrade in weaponry as and when it became available. The early variants (A–E) all mounted the 37mm gun, while later versions (F–M) were generally equipped with a short or long version of the 50mm gun. The final variant, the Ausführung N, mounted a 75mm L/24 howitzer and was used in a fire-support role with Panzergrenadier divisions. The armour protection was initially only 30mm (1.18in) as standard, but this was also gradually increased over the development history of the tank.

Although only 98 early variants of the Panzer III were available for the campaign in Poland in 1939, by the time of the invasion of France in May 1940 nearly 350 had been produced, and it was on the Panzer III that the burden of dealing with the French armour fell, as the German light tanks were not up to the job. The Panzer III succeeded admirably throughout the campaign, and this was probably its finest hour. The next year, 1941, saw the tank committed on a number of fronts, with Panzer IIIs forming the main thrust of the German advance into the Soviet Union while at the same time operating in Greece, the Balkans and North Africa. However, the encounters with KV and T-34 tanks exposed the limitations of the design, and the Panzer III declined in significance in favour of heavier German tanks.

SPECIFICATIONS

Crew: 5

Weight: 24.8 tonnes (27.37 tons)

Power-to-weight ratio: 15.38hp/ton

Overall length: 5.41m (17.8ft)

Width: 2.92m (9.6ft)

Height: 2.51m (8.2ft)

Max. speed: 40km/h (25mph)

Max. range: 175km (108 miles)

Engine: Maybach HL 120 TRM V-12 water-cooled petrol engine, 300hp

Armament: one 50mm KwK L/42 gun with 99 rounds and two 7.92mm machine guns with 3,750 rounds

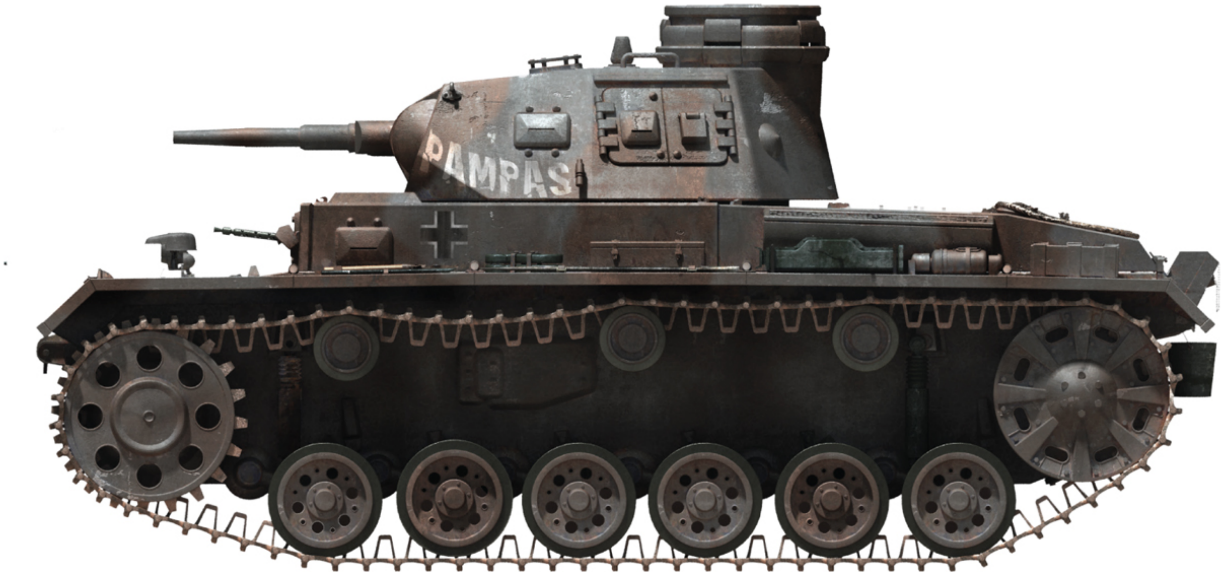
Armour: 30mm (1.18in) hull front; 25mm (0.98in) glacis; 30mm (1.18in) driver's plate; 30mm (1.18in) sides; 17mm (0.67in) decking; 16mm (0.63in) belly; 21mm (0.83in) tail; 30mm (1.18in) turret front, sides and rear; 10mm (0.39in) top

Trench-crossing capability: 2.3m (7.5ft)

Vertical step: 60cm (23.5in)

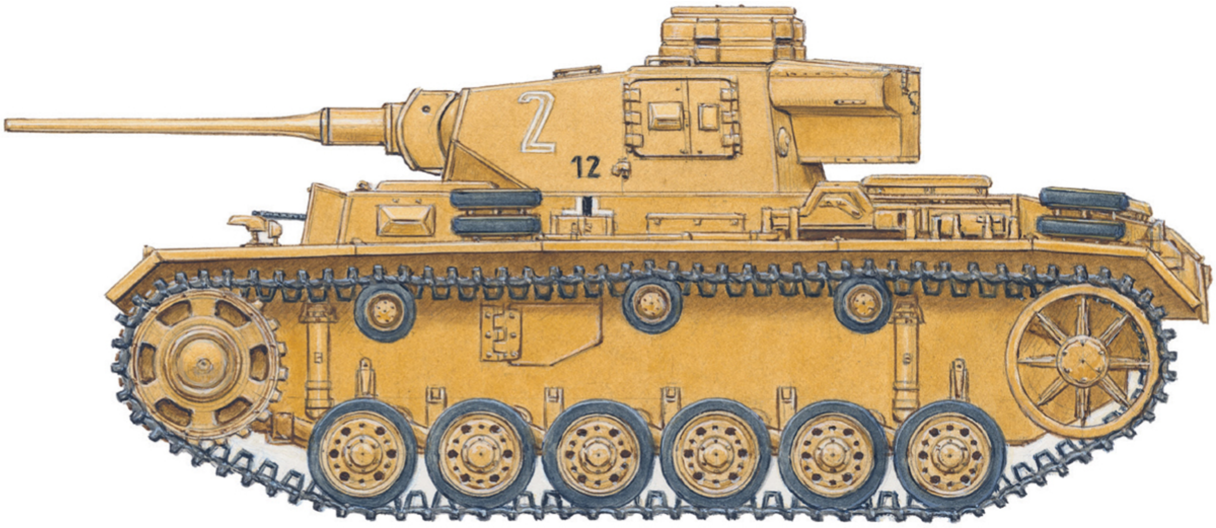
Fording capability: 80cm (31.5in)

TANK DETAILS



PZKPFW III AUSF. F, 1940

The PzKpfw III Ausf. F was essentially the same as the Ausf. E except for the switch from the Maybach HL 120 TR engine to the HL 120 TRM with improved magnetos. One visible change introduced in late 1939 was the addition of a pair of cooling holes through the glacis plate over the steering brakes. These were covered with small armoured cowls, but this feature was not universal, and some plants were continuing to produce the Ausf. F into the spring of 1940 without the cooling feature.



PANZER III AUSF. L, 1942

The Panzer III Ausf. L was produced between June and December 1942. In an effort to make the Panzer III more effective and more survivable in the face of heavier Allied armour, it was given a more powerful 50mm KwK 39 L/60 gun, thicker frontal armour and spaced armour fitted to the superstructure. In the field, however, crews of the Panzer III Ausf. L and later tanks sometimes removed the spaced armour from the mantlet to improve the gunner's vision.

THE PANZER 38(t)

The PzKpfw 38(t) was the only tank of foreign origin to remain in production for the Wehrmacht through World War II. When Germany occupied the Czech provinces in 1939, it inherited the small but sophisticated Czech tank industry. The best of the new Czech tanks, the LT 38, was an essential element in enlarging the Panzer force in 1939–41. German light tanks were armed with machine guns and 20mm cannon, but the Czech tanks offered an excellent 37mm gun, comparable to that on the PzKpfw III medium tank. The initial batch of LT 38 tanks built for the Czechoslovak Army were adopted by the Wehrmacht as the PzKpfw III(t). In January 1940, the designation was changed to PzKpfw 38(t).

Although the Heereswaffenamt was not especially enthusiastic about accepting foreign designs, the Czech industrial capacity was an attractive shortcut to building up the Panzer force quickly. The PzKpfw III(t)/PzKpfw 38(t) saw action in the opening campaign in Poland in September 1939 and German invasions of the West, Greece and the Soviet Union in 1940–41. Despite their light specifications, they had some influence: by the time of the 1940 campaign in Western Europe, for example, over 200 PzKpfw 38(t) tanks had been delivered, and Czech tanks amounted to about 13 per cent of German tank strength. A total of 54 PzKpfw 38(t) tanks were written off as losses after the campaign, but in fact all but six were later rebuilt. During the invasion of the Soviet Union on 22 June 1941, the PzKpfw 38(t) represented about 20 per cent of the tanks taking part in the attack. The fighting in 1941, and the appearance of the new Soviet T-34 and KV tanks, however, made it clear that the PzKpfw 38(t) was obsolete. Plans to continue production throughout 1942 were changed, and production of the PzKpfw 38(t) Ausf. G ended in June 1942. By the end of 1942, there were only about 300 PzKpfw 38(t) tanks in service, and they were gradually retired to secondary roles, for example anti-partisan warfare, reconnaissance and training.

SPECIFICATIONS

Crew: 4

Weight: 9.8 tonnes (10.8 tons)

Power-to-weight ratio: 12.7hp/ton

Overall length: 4.61m (15.12ft)

Overall width: 2.14m (7.02ft)

Overall height: 2.25m (7.38ft)

Ground pressure: 0.64kg/cm^2 (9.11psi)

Ground clearance: 0.4m (1.31ft)

Engine: Praga NHPS/II 125hp, 6-cylinder petrol

Transmission: Praga-Wilson CV, 1 reverse, 5 forward

Fuel capacity: 220 litres (58 gallons)

Max. speed (road): 42km/h (26mph)

Max. speed (off-road): 15km/h (9.3mph)

Trench-crossing capability: 1.9m (6.23ft)

Fording capability: 0.9m (2.95ft)

Vertical step: 0.8m (2.62ft)

Armour: 25mm (0.98in) turret front; 25mm (0.98in) hull front; 15mm (0.59in) hull side

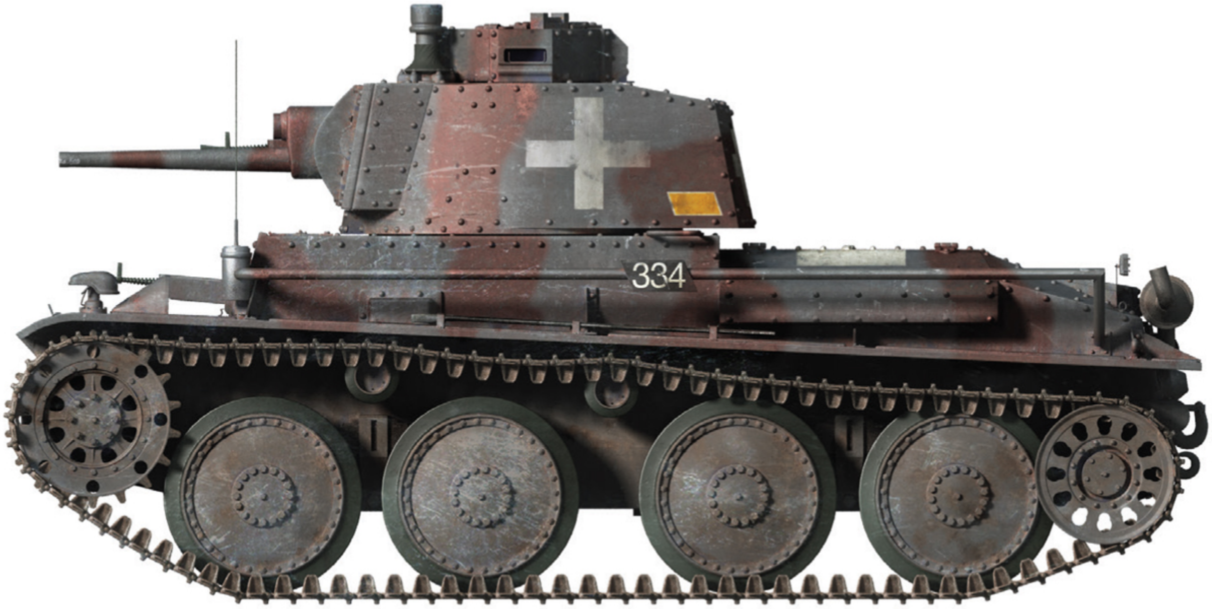
Main armament: 37mm KwK 38(t) gun

Secondary armament: 2 × 7.92mm ZB-53 (MG 37(t)) machine guns

Stowed main gun rounds: 90 rounds

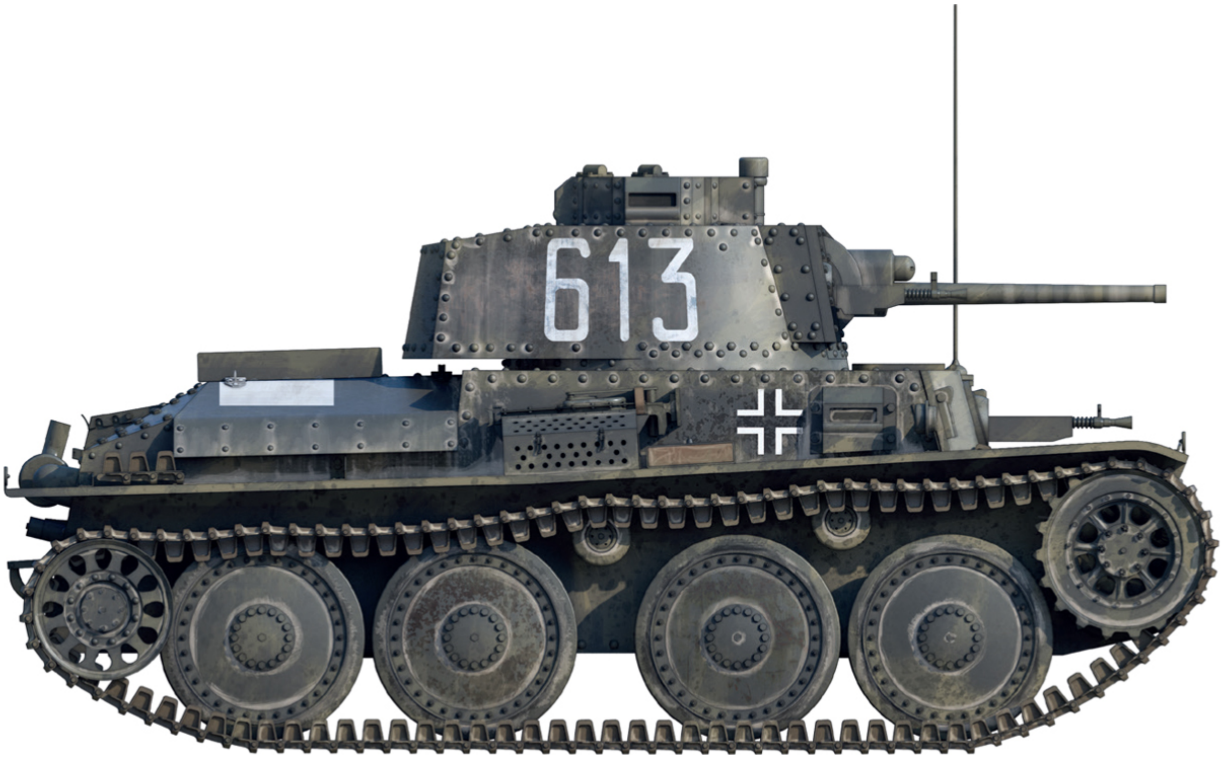
Stowed machine gun rounds: 2,700 rounds

TANK DETAILS



PZKPFW 38(t) AUSF. A, POLISH CAMPAIGN, SEPTEMBER 1939

At the time of the Polish campaign, the Wehrmacht used a plain cross as national insignia, as seen here. This insignia proved too visible to enemy anti-tank gunners and was abandoned after the campaign, being replaced with a reduced-visibility style. For air identification, a white rectangle was painted on the engine deck. In the 1930s, tactical numbers were painted in white on a black, detachable plate carried on either side of the vehicle.



PZKPFW 38(t) AUSF. B, FRANCE, 1940

Panzer-Brigade 11 directed Panzer-Regiment 25 and Panzer-Abteilung 66. These two formations could be distinguished by their tactical numbers, with Pz.Rgt.25 using red numbers with a white trim and Pz.Abt.66 using thinner white numbers, as seen here. The numbers in this case indicate 6. Kompanie, 1. Zug, Panzer Nr. 3. This tank was probably marked with the divisional insignia on the upper left of the front superstructure plate. It was camouflaged in the finish of Dunkelgrau Nr. 46 and Dunkelbraun Nr. 45.

THE PANZER IV

The Panzer IV has a reputation as the ‘work horse’ of the German Panzer forces in World War II. While it did not have the sleek appearance of the Panther, nor the awe-inspiring bulk of the Tiger, it could get the job done. Developed from October 1935, the Panzer IV with the short-barrelled 7.5cm KwK L/24 was highly successful in its intended combat role as an infantry-support tank, living up to its code name of ‘Begleitwagen’ (escort tank – abbreviated to B.W.) by providing effective high-explosive fire. After encountering the Russian T-34/76 and KV-1 tanks in the summer of 1941, however, the troops wanted a tank that could knock out enemy tanks at long range. This version of the Panzer IV was created by replacing the short-barrelled gun in the turret with a long-barrelled 7.5cm KwK 40 L/43 or L/48.

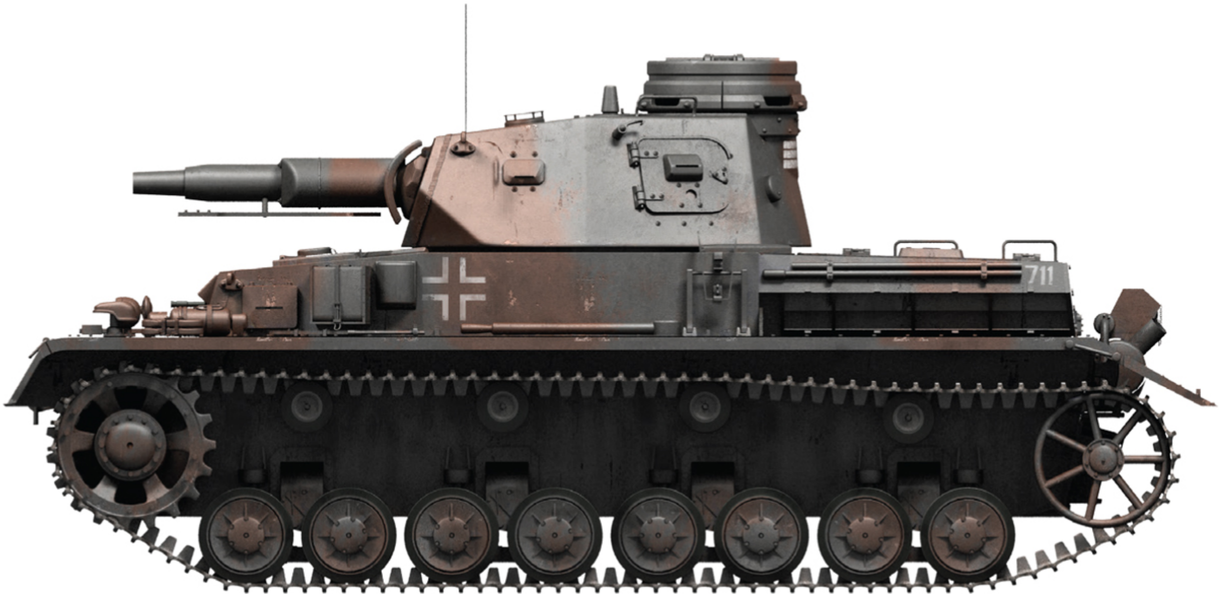
The Panzer IV has the distinction of being the only German tank to remain in continuous production throughout World War II. Even in 1945 it was still a highly effective battlefield weapon and the match of any British or US counterpart. It was not until July 1944 that Shermans equipped with the 76mm gun began to appear, finally matching the Panzer IV in firepower. The Panzer IV made up roughly half of all German tanks in use on the Western Front in 1944–45 and played a major part in the Ardennes offensive, where their good mobility and ability to cross difficult terrain enabled them to spearhead the push into enemy lines. After the failure of this operation, the tank was only encountered again in declining numbers, most of the crumbling German defence relying on small battlegroups built around a few assault guns or Panzerjäger.

Though by 1945 it was eventually outclassed by its brothers, the Panther and Tiger, and outgunned by the Russian IS series and the new T-34/85, the Panzer IV remained in use right up until the end of the war, and had the merit of being present in large numbers – more than 8,500 were produced during the conflict.

SPECIFICATIONS

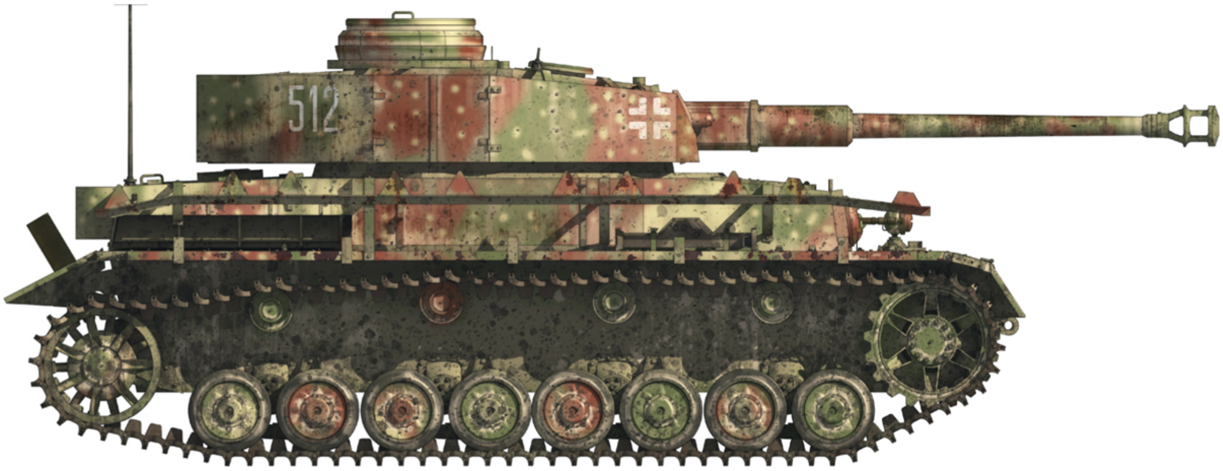
Combat weight: 25 tonnes (27.6 tons)
Power-to-weight ratio: 10.9hp/ton
Overall length: 7.02m (23ft)
Width: 2.88m (9.4ft)
Height: 2.68m (8.8ft)
Max. sustained speed (road): 25km/h (15.5mph)
Average speed (cross-country): 20km/h (12.4mph)
Max. speed: 38–42km/h (23–26mph)
Max. range (road): 320km (199 miles)
Max. range (cross-country): 210km (130 miles)
Trench-crossing capability: 2.3m (7.5ft)
Fording capability: 0.8m (2.6ft)
Vertical step: 0.6m (1.9ft)
Ground clearance: 0.4m (1.3ft)
Ground pressure: 0.89 kg/cm^2 (12.7psi)
Engine: 11.9-litre V-12 Maybach HL 120 TRM 300 PS 296hp at 2,600rpm
Fuel capacity: 680 litres (150 gallons)
Track on ground: 3.52m (11.5ft)
Transmission: SSG 76, 6 forward, 1 reverse gears
Armament: 7.5cm KwK 40 L/48; 7.5cm PzGr 39 (armour-piercing); 7.5cm PzGr 40 (armour-piercing, tungsten core); 7.5cm PzGr SprGr (high-explosive)
Stowed main gun rounds: 87
Stowed machine gun rounds: 2,250

TANK DETAILS



PZKPFW IV AUSF. D, MAY 1940

The PzKpfw IV was armed with a short 75mm gun intended for fire support and not tank fighting. The Ausf. D variant, as seen here, had an added shield for the gun mantlet and returned to the use of a hull machine gun which had been deleted in the Ausf. B and C. The depth of the side armour was also increased. A total of 248 Ausf. D models were produced.



PZKPFW IV AUSF. J, 1944

During the Ardennes offensive of 1944–45, the II. Abteilung, Panzer-Regiment 16, was equipped with the PzKpfw IV. The unit used typical tactical numbers; the first digit indicated the company, the second the platoon, and the third the individual tank. This tank received the standardized factory scheme from the autumn 1944 production, which had small dots of dark yellow over the dark camouflage colours, sometimes called ‘ambush’ camouflage. This particular tank was knocked out during the fighting for Hotton.

THE STURMGESCHÜTZ III

The StuG III assault gun was developed to provide an infantry gun that was more mobile than towed cannon. It eventually evolved into the German infantry's main form of armoured support, essentially the German equivalent of the infantry tanks found in other armies. The initial production version of the StuG III was armed with a short 75mm L/24 cannon. This was the same armament used on the PzKpfw IV Ausf. D tank and offered performance similar to that of the 75mm light infantry gun. Only 95 StuG IIIs were completed up to the beginning of 1941, however.

Encounters with the new Soviet T-34 and KV tanks during Operation *Barbarossa* in June 1941 came as a great shock to the German infantry. Rheinmetall/Borsig had already developed a longer L/41 75mm gun that was experimentally mounted on a StuG III in the winter of 1940/41. The L/41 gun expanded the mission capabilities of the StuG III, giving it significantly better anti-tank performance while retaining its excellent high-explosive firepower. The L/41 gun was duly lengthened to L/43 to improve its anti-tank performance and was fitted to the new StuG III Ausf. F, which entered production in February 1942.

Hitler received glowing reports of the performance of the StuG III in Russia and began to see it as a critical ingredient in creating mobile pockets of resistance to reinforce the embattled infantry. Hitler also encouraged the army to reinforce the StuG III's armour protection to better resist Soviet 76mm guns. Hitler supported the enhancement of the StuG III firepower to parallel the improvement process on the PzKpfw IV tank with a new L/48 75mm gun. This was known as the KwK 40 in its tank version and the StuK 40 in its assault-gun version. The new L/48 resulted in the StuG III Ausf. G – the definitive version of the StuG III assault gun – that entered production in December 1942. From 1943, as combat operations became more challenging for the

Germans, the StuG III significantly bolstered the German infantry’s fighting power, essentially becoming the Wehrmacht’s infantry tank, even if it was not officially designated as such.

SPECIFICATIONS

Crew: 4

Weight: 22 tonnes (24.25 tons)

Power-to-weight ratio: 13.6hp/ton

Overall length: 5.4m (17.72ft)

Overall width: 2.95m (9.68ft)

Overall height: 1.96m (6.43ft)

Ground pressure: 0.96kg/cm^2(13.67psi)

Ground clearance: 0.38m (1.2m)

Engine: Maybach HL 120 TR 11.9 litres, 300hp at 3,000rpm

Transmission: ZF SSG 77, 6 forward, 1 reverse

Fuel capacity: 320 litres (84.5 gallons)

Max. speed (road): 40km/h (25mph)

Max. speed (off-road): 24km/h (15mph)

Max. range (road): 160km (99 miles)

Trench-crossing capability: 2.3m (7.55ft)

Fording capability: 0.8m (2.62ft)

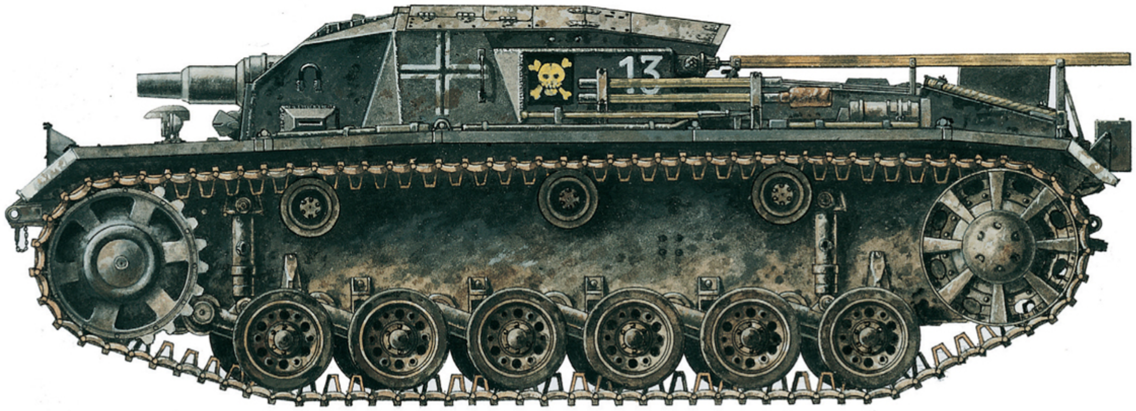
Vertical step: 0.6m (1.97ft)

Armour: 50mm (1.97in) lower hull and mantlet; 30mm (1.18in) sides and rear

Main armament: 75mm StuK 37 L/24

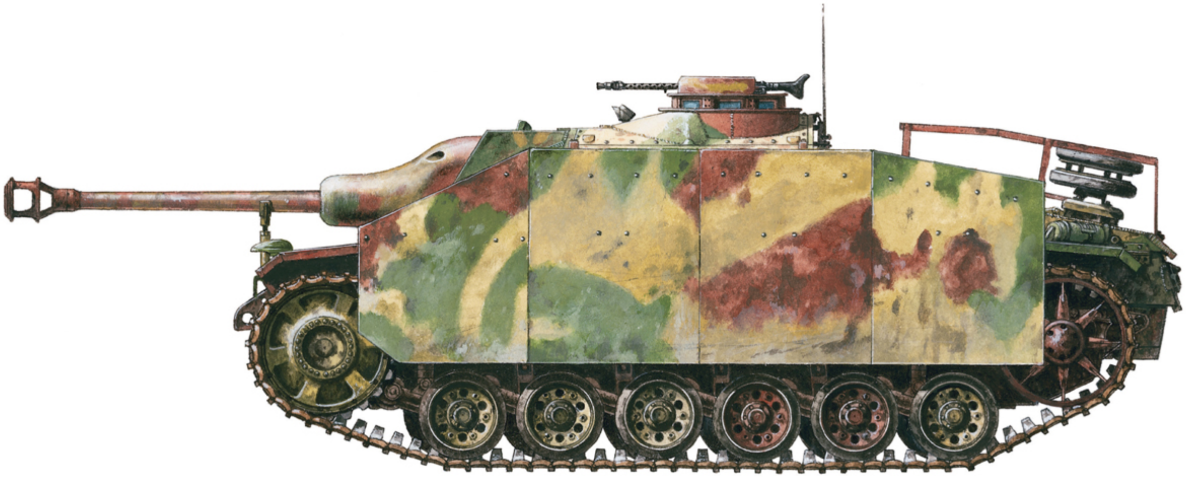
Stowed main gun rounds: 44

TANK DETAILS



STURMGESCHÜTZ AUSF. B, RUSSIA, 1941

In April 1941 the Sturmgeschütz-Abteilung 192 was renamed Sturmgeschütz-Abteilung *Grossdeutschland*. The detachment’s Sturmgeschütz Ausf. B were painted in RAL 7021 dark grey. The front and rear mudflaps had their outer edges outlined in white. Markings include the *Totenkopf* (death’s head) emblem in yellow on a black rectangle. Some vehicles had this in white painted directly on to the base camouflage colour.



STURMGESCHÜTZ AUSF. G, 1944

This Sturmgeschütz Ausf. G has an external travel lock for the gun on the front upper nose plate and a co-axial machine gun in the *Topfblende* cast gun mantle. On the fighting compartment roof is a *Rundumsfeuer* (remote-controlled) machine gun, *Pilze* sockets for a 2-ton jib crane, and a *Nahverteidigungswaffe* (traversable close-defence weapon).

THE TIGER I HEAVY TANK

Probably the most famous tank of World War II, the Tiger I was quickly designed utilizing components that had been partially tested in previous heavy Panzers. While limited development of heavy Panzer designs had commenced in 1937, the first serious efforts resulted from a meeting with Hitler on 26 May 1941. Design of the Tiger I was thus not initiated as a response to the T-34 and KW tanks encountered during Operation *Barbarossa* in June 1941. Instead, the main concerns addressed during the meeting were the problems of successfully combating British tanks and anti-tank guns. However, after the appearance of the T-34 and KW, the design and production of an effective heavy Panzer was pursued with increased urgency.

Although the Tiger I was an extremely powerful weapon, it brought with it many problems, not least of which was its great weight, which limited the bridges it could cross and thus operational mobility. It was also a highly complex machine and prone to breakdowns. The Tiger was designed as an offensive weapon, but by the time it was used on the battlefield Germany was on the defensive, and the Tiger was rushed from place to place to lend its heavy firepower to the defence, often exacerbating its mechanical problems.

Nevertheless, the Tiger I was extremely successful in combat with other tanks. In the East this is reflected in reports from the schwere Panzer-Abteilung 503. and 506.. From the beginning of the battle of Kursk on 5 July until 21 September 1943 the 503. claimed to have destroyed 501 enemy tanks, 388 anti-tank guns, 79 artillery pieces and seven aircraft. On the Western Front, the British and Americans had no tank that could go toe-to-toe with the Tiger, and tank crews dreaded encountering it. The Tiger could only be defeated at extremely close range by Allied tank guns, and the Sherman Firefly variant was designed as a direct counter to German heavy-tank designs. The effectiveness of the Tiger was limited by the small numbers available and the overwhelming numerical superiority of Allied armour, but it still remains one of the most successful tanks of World War II.

SPECIFICATIONS

Crew: 5

Combat weight: 58 tonnes (64 tons)

Power-to-weight ratio: 12.3hp/ton

Ground pressure: 0.735kg/cm^2 (10.5psi)

Overall length: 8.45m (27.7ft)

Width: 3.7m (12.1ft)

Engine: Maybach HL 230 P45 V-12 petrol

Transmission: Maybach Olvar Type OG 40 12 16 B, 8 forward, 4 reverse gears

Max. speed (road): 45.5km/h (28.3mph)

Max. speed (cross-country): 15–20km/h (9–12mph)

Best cruising speed: 38km/h (23.6mph)

Max. range: 195km (121 miles) at cruising speed

Sight: T.Z.F 9c (monocular, magnification 2.5x and 5x)

Fording capability: 1.6m (5.2ft)

Armament: 8.8cm KwK 36 L/56

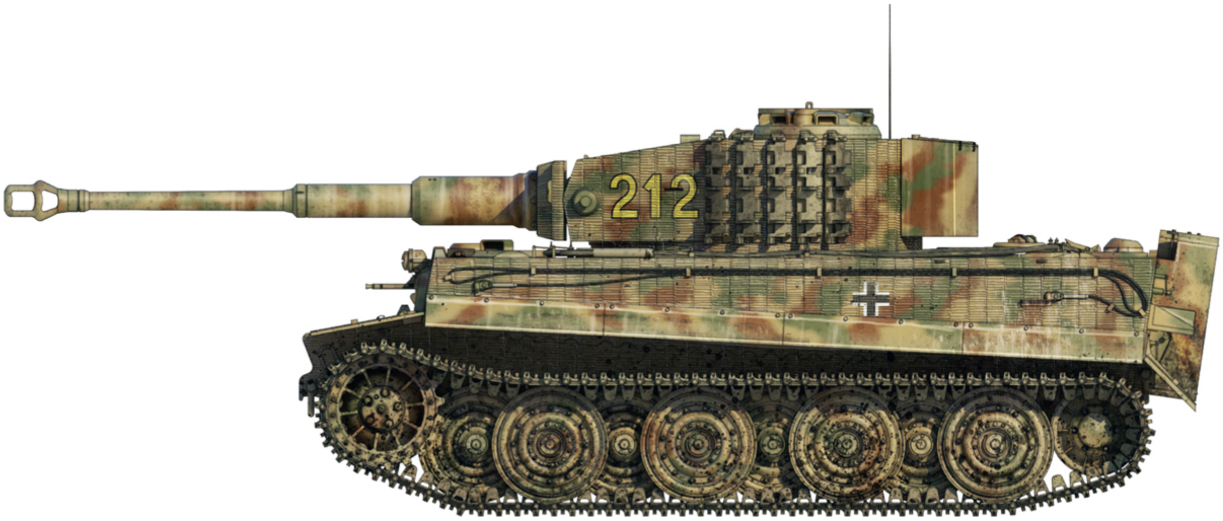
Main gun ammunition: 8.8cm PzGr 39 (armour-piercing), 8.8cm PzGr 40 (armour-piercing, tungsten core), 8.8cm Gr 39 (hollow charge)

Muzzle velocity: 773m/sec (2,536ft/sec) (PzGr 39)

Stowed main gun rounds: 92

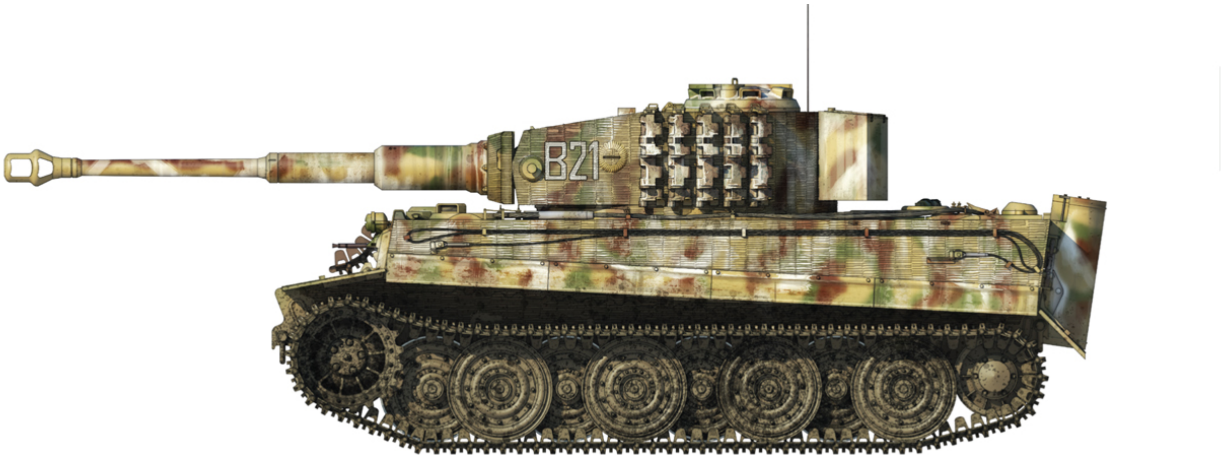
Gun depression/elevation: -9 / +10 degrees

TANK DETAILS



TIGER I, NORMANDY, JUNE 1944

This is the Tiger I used by the infamous Waffen-SS commander Obersturmführer Michael Wittmann during a notable action against Allied armour at Villers-Bocage in Normandy on 13 June 1944, during which Wittmann is claimed to have destroyed up to 29 tanks and vehicles using his Tiger I. Wittmann did not always use the same tank. There is a well-known series of photos of him in his usual tank, number 205, on 7 June, but there is also film footage of him on Tiger 231 on 9–10 June.



TIGER I, EAST PRUSSIA, JANUARY 1945

This Tiger I served in the III. schwere Abteilung of Panzer-Regiment *Grossdeutschland*. The camouflage pattern on this tank has been hastily broken up with whitewash. The standard vehicle camouflage adopted in 1943 consisted of a base finish of RAL 7028 dark yellow, with patches of RAL 6003 olive green and RAL 8017 red-brown applied by the unit in the field or depots issuing the tanks.

THE PANTHER MEDIUM TANK

The origins of the Panther tank lay in the shock that the German Army experienced during Operation *Barbarossa* – its June 1941 invasion of the Soviet Union. The Soviets' T-34/76 medium tank outclassed every German tank then in service. Beginning in November 1941, the 'Panther Commission' commissioned several prototypes to counter this threat, culminating in the 15 May 1942 decision to contract the production of the Panzerkampfwagen V Panther, the first mass-produced Panther tank. Entering service in January 1943, the Panther provided Germany with an excellent medium tank, and one that would become one of the most feared vehicles of the war.

Perhaps the most impressive aspect of the Panther was its lethality, even at long range. Firing the PzGr 39/42 and 40/42 armour-piercing rounds at a normal combat range of 1,000m (0.62 miles), the Panther could penetrate 111mm (4.37in) and 149mm (5.87in) thick armour at an angle of 30 degrees, which was enough to deal with nearly all enemy tanks. The other great strength of the Panther was its battlefield survivability, which rested mainly on its thick, well-sloped frontal armour. The Soviet T-34/85 could only penetrate this at a range of 500m (0.31 miles), and the 75mm-gunned Sherman M3A2 could not do so even at point-blank range. This created a situation in which the Panther could confidently destroy almost any enemy tank at long range, while its opponent needed to either close to dangerously short ranges or manoeuvre around to the Panther's sides or rear, where the Panther had much weaker armour.

The Panther was rushed into combat during the 1943 battle of Kursk before it was fully ready, and therefore it suffered from a number of teething problems in its early battlefield use. Throughout the final years of the war, however, the Panther was an excellent medium tank that saw use on both fronts, and its effectiveness prompted the Allies to design heavier tanks to counter it, such as the M-26 Pershing and

Soviet IS-2. Its use late in the war undoubtedly enabled the German Army to resist overwhelming Allied pressure for significantly longer than would otherwise have been possible.

SPECIFICATIONS

Crew: 5

Weight: 45.5 tonnes (50 tons)

Power-to-weight ratio: 15.6hp/ton

Overall length: 8.86m (29.1ft)

Overall width: 3.3m (10.8ft)

Overall height: 2.95m (9.7ft)

Engine: Maybach HL 230 P30 V-12 liquid-cooled petrol, 690hp

Max. speed: 55km/h (34mph)

Max. range: 177km (110 miles)

Trench-crossing capability: 1.9m (6.2ft)

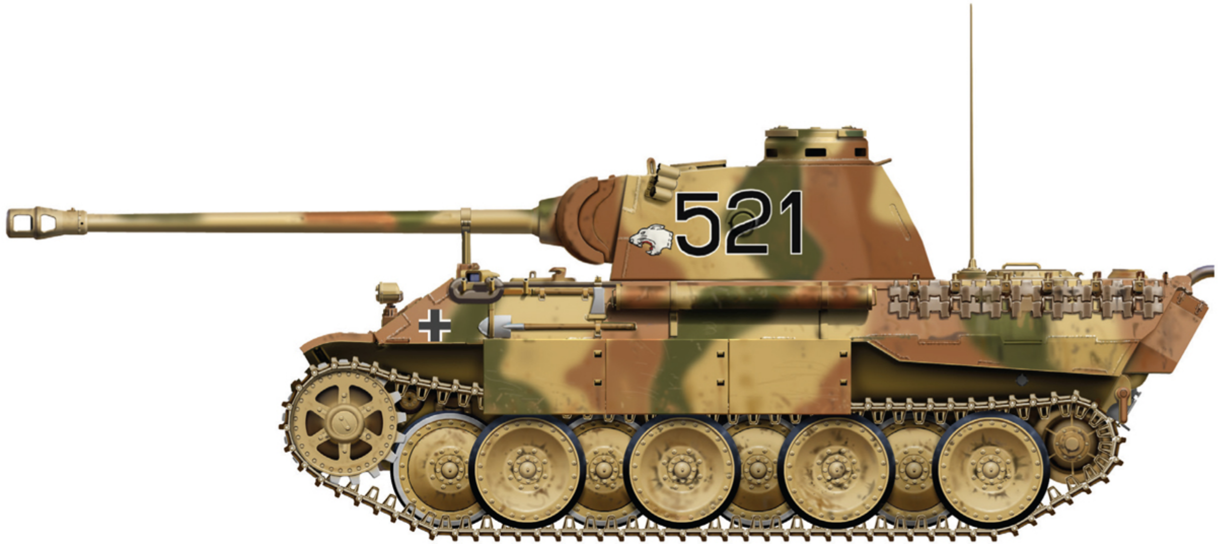
Vertical step: 90cm (35.4in)

Fording capability: 1.4m (4.6ft)

Armament: 75mm KwK 42 (L/70) gun with 79 rounds and two 7.92mm MG 34 machine guns with 4,500 rounds

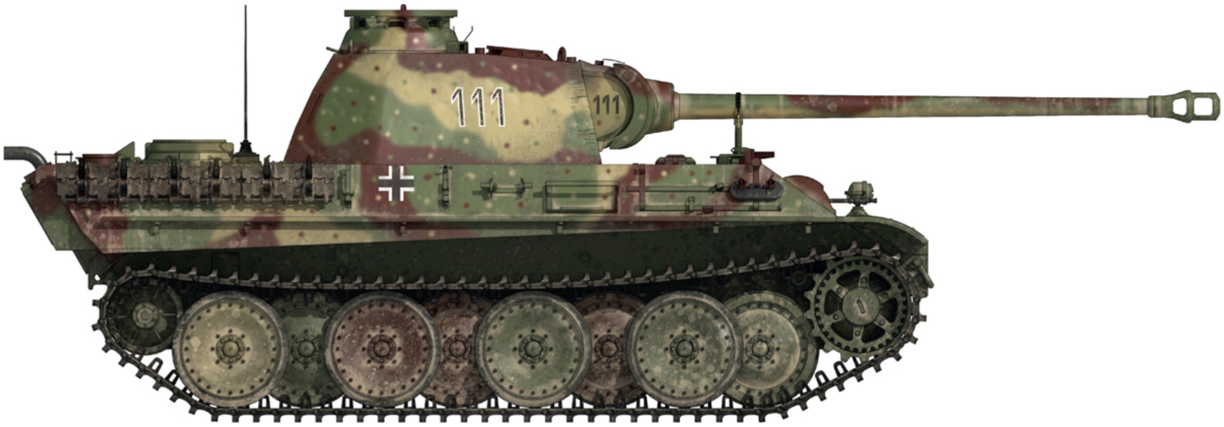
Armour: 80mm (3.15in) hull front; 50mm (1.97in) sides; 40mm (1.57in) rear; 15mm (0.59in) decking; 20 + 13mm (0.79 + 0.51in) belly; 110–120mm (4.3–4.72in) turret front; 45mm (1.77in) sides and rear; 15mm (0.59in) top

TANK DETAILS



PANTHER AUSF. D, KURSK, JULY 1943

A Panther Ausf. D from the battle of Kursk in July 1943. The number 521 indicates the first tank in the 2nd Platoon of the Panzer-Abteilung 52. Panthers used a wide variety of camouflage schemes during the period July–August 1943, and the stylized panther heads disappeared from turrets after Kursk. A total of 842 Panther Ausf. D tanks were built before production shifted to the improved Ausf. A model in September 1943.



PANTHER AUSF. G, 1944

The Panther Ausf. G was a superb vehicle in terms of armoured protection, mobility and firepower. This Panther was commanded by SS-Untersturmführer Hans Hennecke (many Panthers gravitated into Waffen-SS service). It was hit by US anti-tank gunfire on the right rear side during the fighting in Stavelot in the Ardennes on the morning of 18 December 1944. It was subsequently repaired but then abandoned in front of La Gleize town hall during the retreat.

THE JAGDPANTHER

The Panzerjäger ('armour hunter') concept became increasingly important to the Wehrmacht's armour branch from 1940 onwards. Known better in the West as 'tank-destroyers', vehicles that fell under this umbrella were those that married a powerful anti-tank gun to a tracked chassis, to provide a combination of firepower and mobility without the engineering demands of the turrets found on conventional tanks and the costs of heavy armour. The Panzerjäger nevertheless came to embrace heavily armoured vehicles by the last years of the war, and posed a lethal and plentiful threat to Allied vehicles.

The best of the Panzerjäger designs was that of the Jagdpanther, which combined the Panther chassis with the same powerful 88mm gun as the Tiger II. It had excellent frontal armour as well. Production began in December 1943. The early production Ausf. G1 Jagdpanthers were built on the Panther Ausf. A chassis. Although a six-man crew had been proposed, the second loader role was eliminated during the production stage, which allowed the number of 88mm rounds carried to be increased from 50 to 60. The one-piece gun tube and breech could be removed from the cradle through a large rear hatch after some preparation.

Compared with the early production Jagdpanthers, those made after December 1944 (designated Ausf. G2) had a longer engine deck and a shorter, more steeply angled rear superstructure. These vehicles had their exhaust systems enhanced with flame arrestors/suppressors, and units in the field were instructed to install fabricated protective sheet-metal covers from Schürzen plates to protect the engine deck's air-intake units. There were no Jagdpanther variants. Krupp did work on mounting the 88mm gun on a rear-positioned superstructure, as well as a Jagdpanther II armed with a 128mm PaK 80 L/55 gun, but neither was realized before war's end.

In combat, the Jagdpanther suffered the same flaws in its power train as the basic Panther. This was exacerbated by the excessive weight towards the front of the vehicle and the difficulty of repairing the transmission and frontal drive in the field.

SPECIFICATIONS

Crew: 5

Combat weight: 25.5 tonnes (28.1 tons)

Power-to-weight ratio: 13.15hp/ton

Overall length: 9.65m (31.66ft)

Overall width: 3.27m (10.73ft)

Overall height: 2.72m (8.92ft)

Ground pressure: 0.89kg/cm^2(12.66psi)

Ground clearance: 0.56m (1.8ft)

Engine: Maybach HL 230 P30 12-cylinder (water-cooled) 23.1-litre (6-gallon) petrol

Transmission: Zahnradfabrik AK 7-400; 7 forward, 1 reverse

Fuel capacity: 720 litres (190 gallons)

Max. speed (road): 46km/h (29mph)

Max. speed (off-road): 24km/h (15mph)

Range (operational): 140km (87 miles) road; 110km (68 miles) off-road

Trench-crossing capability: 2.45m (8ft)

Fording capability: 1.55m (5ft)

Vertical step: 0.9m (2.95ft)

Armour: 80mm (3.15in) glacis; 45mm (1.77in) hull side; 40mm (1.57in) hull rear; 16–25mm (0.63–0.98in) hull roof; 100mm (3.94in) mantlet

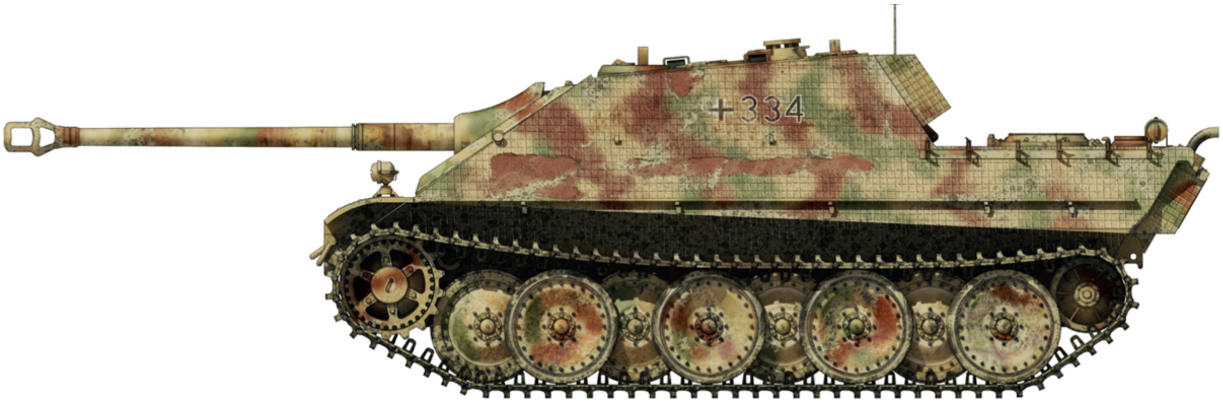
Main armament: 88mm PaK 43/4 L/71

Secondary armament: 7.92mm MG 34

Stowed main gun rounds: 58

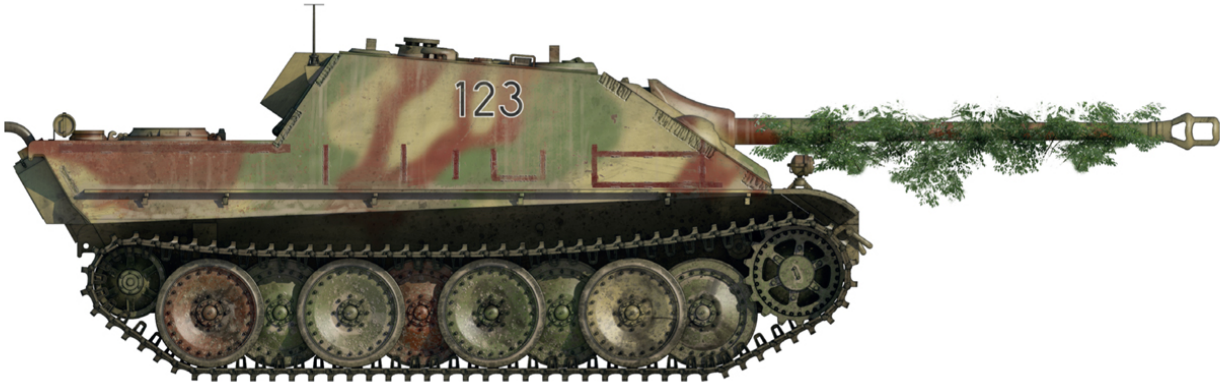
Stowed machine gun rounds: 600

TANK DETAILS



JAGDPANTHER, FRANCE, AUGUST 1944

Jagdpanther 334 was commanded by Unteroffizier Teltau. It was abandoned due to mechanical problems during the British Army's Operation *Bluecoat* offensive near Saint-Georges-d'Aunay on the night of 2/3 August 1944. The schwere Panzerjäger-Abteilung 654, to which this tank belongs, made a number of modifications on their vehicles, including the transfer of the tube for the barrel cleaning rods from the left hull side to the rear engine deck. They also removed the tool stowage racks on the hull side.



JAGDPANTHER, GERMANY, MARCH 1945

This Jagdpanther is in the typical post-September 1944 scheme of red lead primer with patches of RAL 7028 dark yellow and RAL 6003 olive green. The unit to which it belongs had the practice of removing the tool stowage from the sides of the vehicle and rearranging them on the rear for more convenient access, a process that was undertaken when re-equipping at Grafenwöhr in October 1944. As a result, the outlines of the tool racks can be seen silhouetted on the hull side where the red lead primer has been exposed.

THE TIGER II/KING TIGER HEAVY TANK

The Tiger II tank, produced from February 1944, was the ultimate heavy tank of World War II. The imposing name of Königstiger has been variously translated as 'King Tiger' or 'Royal Tiger', which summed up the awe with which the tank was held by Allied troops. But the tank was more prosaically known as the Tiger II. It was one of the heaviest, most thickly armoured and powerfully armed tanks of the war. Like the Tiger I, the Tiger II paid for its power with increased weight and mechanical problems. By the time it was entering a battlefield role on the Western Front, it was generally used in a static defensive role, mitigating this disadvantage somewhat, but it did prove problematic during the Ardennes offensive.

The Tiger II's 8.8cm KwK 43 (L/71) was a very accurate gun capable of first-round hits at ranges exceeding 1,000m. It was also extremely powerful and capable of penetrating 193mm of armour at a range of 1,000m (0.62 miles). Along with its extremely effective main gun, the Tiger II's major asset was the thick frontal armour. Even the side and rear armour protection was sufficient to eliminate any serious threat from the American 75mm or Russian 76mm tank guns.

The Tiger II was first used in combat in July 1944 in Normandy and subsequently on the Eastern Front. As was the case with the Tiger I and Panther, US and British tanks had a difficult time engaging it from the front, as they lacked any heavy tanks of their own. Only the up-gunned British Sherman Firefly firing APDS (Armour-Piercing Discarding Sabot) ammunition could penetrate its frontal hull and turret armour. The main problem the Tiger IIs had was a lack of sufficient numbers to make a significant impact on the war, and a lack of well-trained crew, as by this stage the Wehrmacht was reaching the limit of its manpower reserves. Crews who had never used a Tiger II were assigned to them when they were already on their way to the front. This exacerbated mechanical problems, as crews were unfamiliar with their vehicles.

SPECIFICATIONS

Crew: 5

Combat weight: 69.7 tonnes (76.9 tons)

Power-to-weight ratio: 9.89hp/ton

Hull length: 6.4m (21ft)

Overall length: 10.29m (33.8ft)

Width: 3.76m (12.3ft)

Engine: Maybach HL 230 P30 V-12 petrol, 700hp

Transmission: Maybach Olvar Type OG 40 12 16 B, 8 forward, 4 reverse gears

Fuel capacity: 860 litres (189 gallons)

Max. speed (road): 38km/h (23.6mph)

Max. speed (cross-country): 15–20km/h (9–12.5mph)

Max. range: 170km (105mph) at cruising speed

Max. effective range: 10km (6.2 miles) (SprGr 40/43)

Fuel consumption: 5 litres/km (1.77 gallons/mile)

Armament: 8.8cm KwK 43 L/71

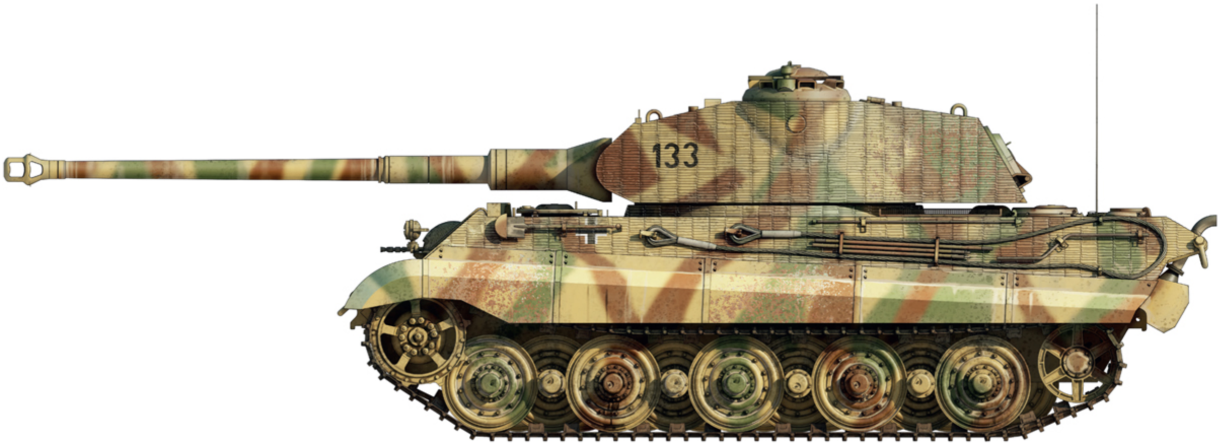
Main gun ammunition: 8.8cm PzGr 39/40 (armour-piercing, tungsten core), 8.8cm PzGr 40/43 (armour-piercing, tungsten core), 8.8cm SprGr 43 (high-explosive), 8.8cm HlGr 39 (hollow charge)

Muzzle velocity: 1,000m/sec (3,280ft/sec)

Gun depression/elevation: -8 / +15 degrees

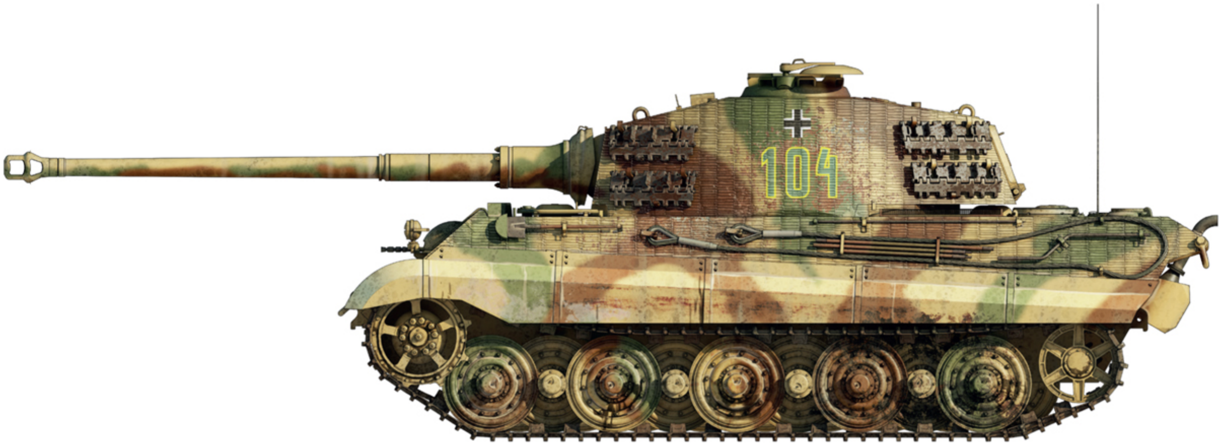
Stowed main gun rounds: 74–84

Stowed machine gun rounds: 3,300



TIGER II, FRANCE, 1944

The Tiger II saw its combat debut on 18 July during the Operation *Goodwood* fighting near Caen. Tank losses in the Caen fighting were so severe that 3. Kompanie, schwere Panzer-Abteilung was pulled out of the line and re-equipped with new Tiger II tanks. This Tiger II, part of 1. Kompanie, schwere Panzer-Abteilung 503 in August 1944, was marked as tactical number 133. It was manufactured with the early style turret and was the 31st Tiger II produced.



TIGER II, 1./SCHWERE SS-PANZER-ABTEILUNG 101, FRANCE, 1944

This Tiger II of 1./s.SS-Pz.Abt. 101 was one of three surviving tanks from a unit that attempted to stop the British 8th Armoured Brigade near Goincourt, west of Beauvais, on 30 August. It was also one of 14 Tiger II tanks shipped to s.SS-Pz.Abt. 101 from July 26, with the final example delivered on 1 August 1944. It was later recovered by the British Army and has been displayed at the Shrivenham and Bovington museums.

THE JAGDPANZER

Strictly speaking, ‘Jagdpanzer’ is a general category of German armour rather than a specific combat vehicle. The English interpretation – ‘hunting tank’ – indicates the purpose of the category. Jagdpanzers were principally heavily armoured, turretless tank-destroyers, the vehicles bringing together a powerful anti-tank gun and a tank chassis.

Although multiple vehicle types could be grouped under the Jagdpanzer label, two in particular took the Jagdpanzer name. The first was the Jagdpanzer IV, Sd.Kfz. 162, which was a Panzer IV chassis equipped with a 75mm high-velocity anti-tank gun, of which three different types were fitted over the course of the tank’s life. The Jagdpanzer IV was a late-war vehicle, only entering full production in January 1944, as an effort to give Germany a greater and more cost-effective armour-killing presence against unequal volumes of Allied armour. It represented a strong mobile defensive asset within the German Panzer formations.

The other Jagdpanzer was the Jagdpanzer 38(t), unofficially called the ‘Hetzer’ in some units. This vehicle mounted the 75mm PaK 39 in a fully enclosed casemate on a modified Czech PzKpfw 38(t) light tank chassis. This chassis was selected for the vehicle largely to exploit the production capacity of the two tank plants in the Czech lands that were not capable of manufacturing larger and heavier types. Production started in April 1944, and by 1945 it became the second most common German armoured vehicle on the Russian Front after the StuG III. It was designated as a Jagdpanzer due to Guderian’s influence and was used mainly in the Panzerjäger companies of the infantry divisions as a cheap substitute for the superior StuG III. The Jagdpanzer 38(t) had good firepower for such a small vehicle. Frontal armour protection was sound, but the side armour was just 20mm (0.79in), meaning it would only protect against machine-gun fire. The vehicle’s elegant and sleek design also hid the fact that its fighting compartment was extremely cramped and inefficient, with poor provisions for vision devices. It was therefore not popular in combat use, though it was clearly superior to using a towed 75mm gun.

SPECIFICATIONS

Crew: 4

Weight: 24 tonnes (26.4 tons)

Power-to-weight ratio: 12.5hp/ton

Overall length: 6.85m (22.47ft)

Overall width: 3.17m (10.4ft)

Overall height: 1.86m (6.1ft)

Ground pressure: 0.86kg/cm^2 (12.23psi)

Ground clearance: 0.4m (1.31m)

Engine: Maybach HL 120 TRM 60-degree 12-cylinder (water-cooled) 11.9-litre petrol

Transmission: Krupp-Wilson ZF Aphon SSG 76; 6 forward, 1 reverse

Fuel capacity: 470 litres (124 gallons)

Max. speed (road): 40km/h (25mph)

Max. speed (off-road): 18km/h (11mph)

Max. range: 210km

Fording capability: 2.2m (7.22ft)

Vertical step: 0.6m (1.97ft)

Armour: 60mm (2.36in) glacis; 80mm (3.15in) mantlet; 20–22mm (0.79–0.87in) hull; 10–60mm (0.39–2.36in) superstructure

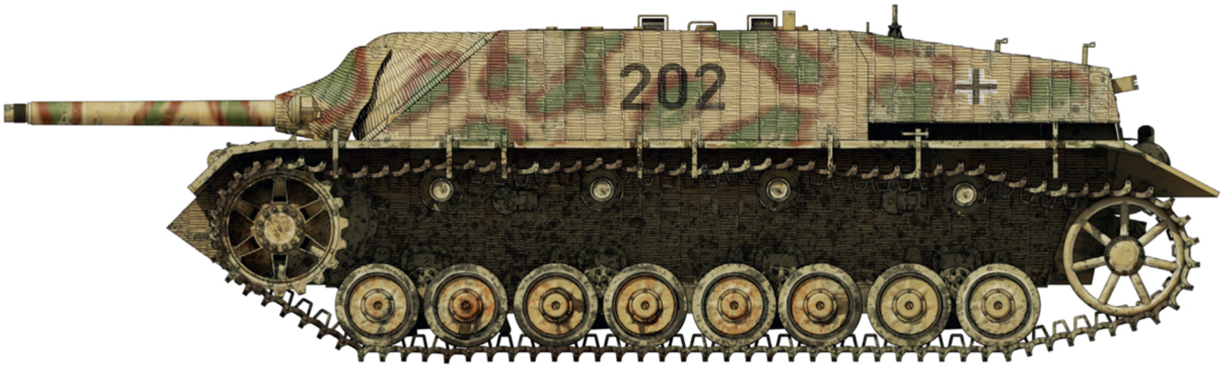
Main armament: 75mm PaK 39 L/48

Secondary armament: 1 × 7.92mm MG 42

Stowed main gun rounds: 79

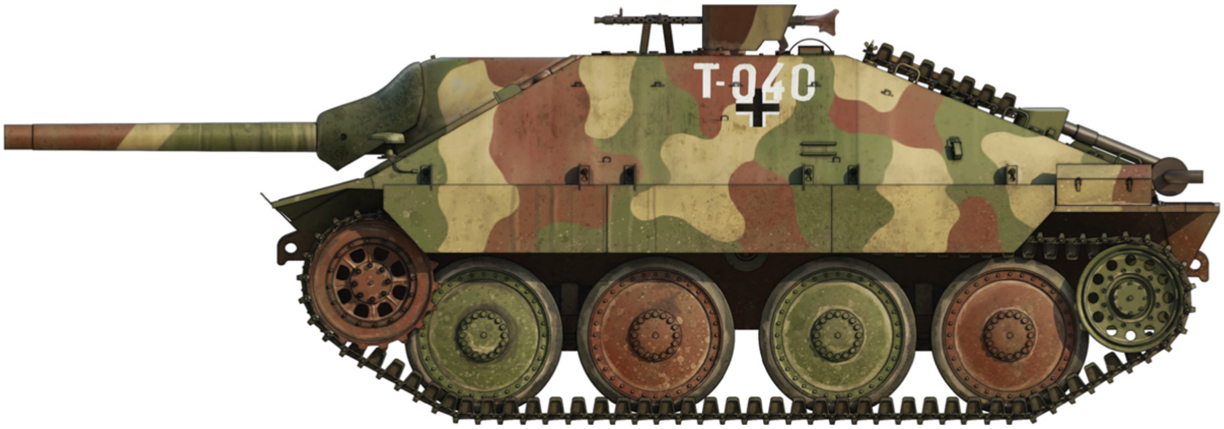
Stowed machine gun rounds: 1,200

TANK DETAILS



JAGDPANZER IV, FRANCE, AUGUST 1944

SS-Panzerjäger-Abteilung 17 was allotted 31 Jagdpanzer IVs in June 1944, but the companies equipped with these did not return to France until 4 August. They fought separately from the rest of the division around Laval and Le Mans. This is a Jagdpanzer IV from 2./SS.Pz.Jg.Abt. 17, knocked out on 8 August near Coulans-sur-Gée on the approaches to Le Mans. Nine Jagdpanzers were destroyed in this fighting. Some of the vehicles had the tactical number in black with white trim, some without the white edging.



JAGDPANZER 38(t), HUNGARY, MARCH 1945

Hungary was allotted 50 Jagdpanzer 38(t) tank destroyers from October and November 1944 orders, and they were delivered in December 1944. They were mainly used to form assault gun battalions in support of the Hungarian infantry divisions. They remained in their original Czech factory colours. The 25th Assault Gun Battalion added tactical numbers in white, as seen here, painted over the German Balkan Cross. They do not appear to have carried Hungarian national insignia.

THE L 3/35 LIGHT TANK

The L 3/35 tankette was Italy's main battle tank until mid-1941, when medium tanks began to be available in quantity. It was actually a re-designation of the Carro Veloce 35 (Fast Tank 35). This diminutive vehicle was in turn an evolution of the CV 33 tankette developed by Ansaldo and accepted into service in 1933. Its structure comprised a simple box hull made of riveted steel plates mostly vertically mounted, with a squared, fixed turret (actually a casemate) mounted on top. It too was made of riveted steel plates, three each side, two in the front and two in the rear. The internal arrangement had the tank divided in three compartments, with the radiator in the rear followed by the engine and the fighting compartment. In the latter, the crew of two was accommodated (machine-gunner/commander, driver) along with the armament, a 6.5mm Fiat 14 aviation machine gun (with 2,240 rounds) mounted on the left side of the turret. External vision was assured by the (relatively) large front vision port for the driver, while two armoured visor slots were located on both sides and on the rear of the turret; with the subsequent production series a removable, aft-sliding plate for improved vision was mounted atop the machine guns on the left side.

In 1934 the CV 33 underwent modifications, bringing to the second production series slightly modified suspensions, vision ports and slots. In 1935, however, the CV 35 entered production. It was shorter than the CV 33, which was 3.2m (10.5ft) long, and had new, twin 8mm Fiat 35 machine-gun armament, a slightly different turret and, in some cases, bolted instead of riveted plates. Further modifications were made to the visor port and slots. By 1936, some 2,800 units of the CV 33-35 had been produced. From November 1938, the CV 35 was officially renamed Carro L 3/35 – the 'L' for light tank followed by weight and year.

SPECIFICATIONS

Crew: 2 (commander/gunner and driver)

Weight: 3.2 tonnes (3.5 tons)

Overall length: 3.17m (10.4ft)

Width: 1.4m (4.59ft)

Height: 1.3m (4.27ft)

Ground pressure: 0.50kg/cm^2(7.12psi)

Ground clearance: 0.25m (0.8ft)

Power-to-weight ratio: 12.44hp/ton

Engine: SPA CV 3-005 engine, 43hp at 2,400rpm

Transmission: 4 forward, 1 reverse

Max. speed (road): 42km/h (26mph)

Max. speed (off-road): 15km/h (9mph)

Max. range: 150km (93 miles)

Trench-crossing capability: 1.45m (4.76ft)

Fording capability: 0.7m (2.3ft)

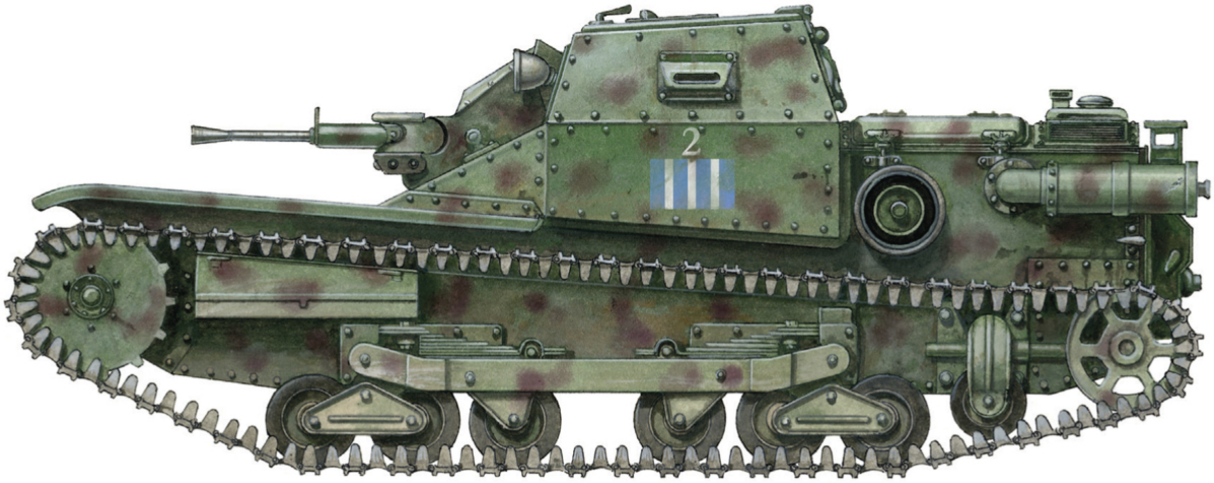
Vertical step: 0.6m (2ft)

Armour: 15mm (0.59in) front; 9mm (0.35in) sides/rear; 6mm (0.24in) floor/roof

Armament: 2 × 8mm Fiat 14/35 or 8mm Breda Model 38

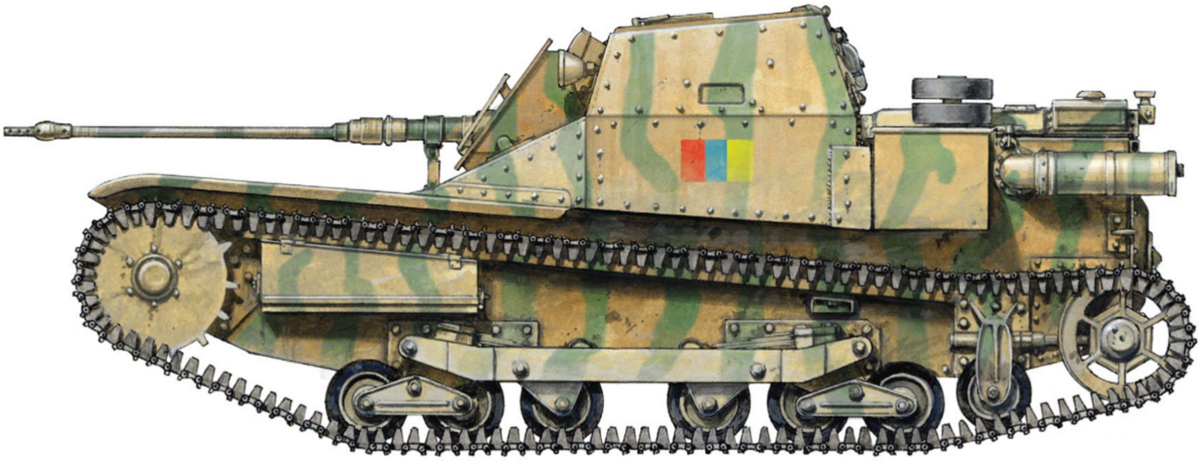
Stowed machine gun rounds: 2,320

TANK DETAILS



L 3/35 TANK, ITALY, 1940

This tank belonged to I Battalion of the 32° Reggimento Carri, part of the 132ª Divisione Corazzata 'Ariete'. The new-type tactical symbol on both hull sides, introduced in 1938, denotes the 4th Platoon (three white bars) of the 2nd Company (blue symbol), with the tank individual number ('2') atop. The tank is camouflaged overall in dark green, a colour introduced in 1933–35 with the CV 33/35 tanks, with small patches of dark earth brown added.



L 3/35 SOLOTHURN ARMED COMMAND TANK, NORTH AFRICA, 1940

Following the supply of 100 20mm Solothurn S18-1100 anti-tank rifles in October 1940, some L 3/35 tanks were modified on the field and re-armed with these, even though the improvement only enabled them to fight against British armoured cars and light tanks, and it greatly limited traverse and handling. This is a battalion command tank, as shown by the three-coloured rectangle, with sand and green stripe camouflage. No other markings are visible.

THE M11/M13 MEDIUM TANK

Specifications for an Italian medium gun-armed tank were issued in 1936, requiring a crew of three, a 37/40 gun in a casemate mount plus two 8mm machine guns in a turret, with armour capable of protecting from armour-piercing bullets and grenade splinters, and a top speed of 32km/h (20mph) on road and 12km/h (7.5mph) off-road. Although short-lived, with only 100 units being commissioned from July 1939, the result was the M11/39 tank. The casemate was made of a frontal plate with the gun mount to the right side. The internal arrangement saw the frontal portion housing transmission, clutch, steering and brake mechanisms, the fighting compartment with the gun on the right side and the driver compartment to the left, with the turret mounted right behind it atop the roof, and the engine compartment to the rear. The main armament was a 37/40 (37mm Vickers-Terni L/40) hull-mounted gun.

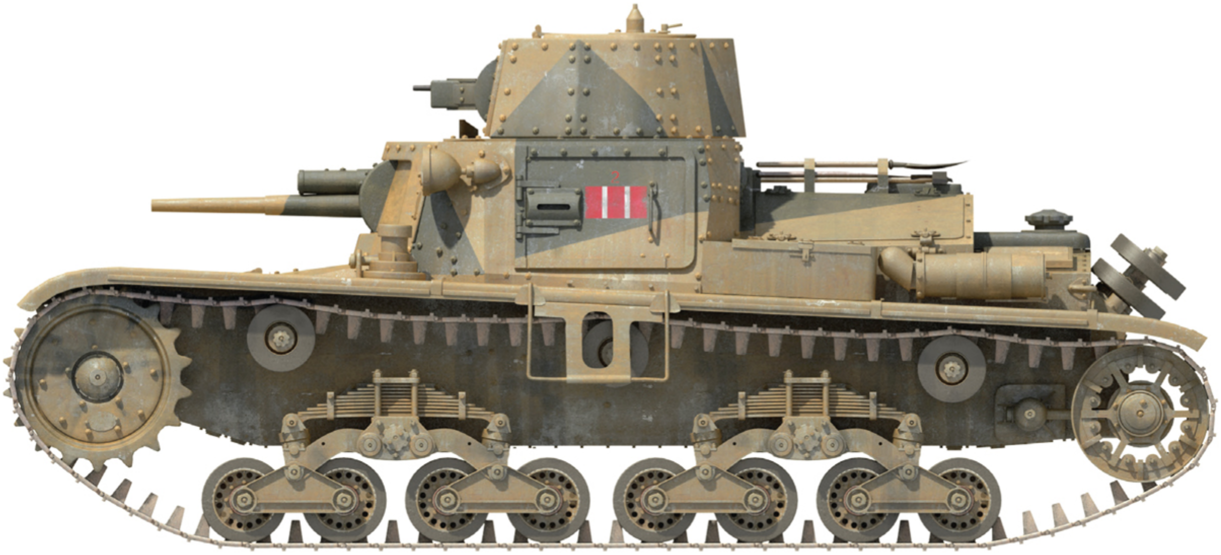
The M11/39 tanks equipped two tank battalions of the 'Ariete' armoured division, while 24 other tanks were sent to Italian Eastern Africa. By early 1941 all of them were lost, either destroyed or captured by the 9th Australian Division, which pressed them into service, eventually handing them over to the 2nd Armoured Division in spring 1941.

Given the clear unsuitability of the M11/39 in tank-versus-tank combat, the army ordered the development of a turret gun-mounted tank, with improved weaponry (the 47/32 standard Italian anti-tank gun), a top speed (on road) of 30–35km/h (18–21mph), a crew of three or four, and a range off-road of 12 hours. This resulted in the M13/40, which entered production early in 1940. Heavier and bigger than the M11/39 on which it was based, the M13/40 weighed 14 tonnes (15.4 tons), with improved armour thickness. The engine, a 12-litre (3-gallon), eight-cylinder SPA 8 TM 40 diesel oil engine, now increased to 125hp. This increase did not prevent the M13/40 from being underpowered, with a top speed on road of 32km/h (20mph). By the end of 1940 the first 250 units were available and were mostly used to equip the tank battalions sent to Libya; they were subsequently lost during the British offensive of December 1940–February 1941.

SPECIFICATIONS

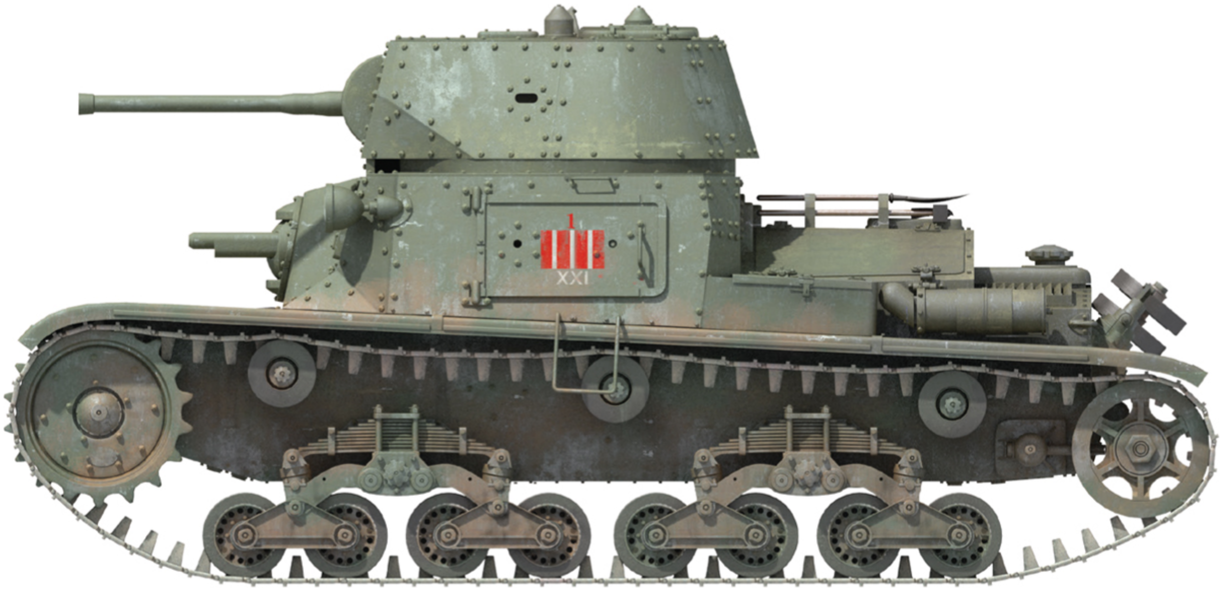
Crew: 3
Weight: 11.2 tonnes (12.3 tons)
Power-to-weight ratio: 10.37hp/ton
Overall length: 4.85m (15.91ft)
Overall width: 2.18m (7.15ft)
Overall height: 2.25m (7.38ft)
Ground pressure: 0.74kg/cm^2 (10.15psi)
Ground clearance: 0.41m (1.35ft)
Engine: SPA 8T diesel, 105hp at 1,800rpm
Transmission: 4 forward, 1 reverse
Max. speed (road): 34km/h (21mph)
Max. speed (off-road): 15km/h (9mph)
Max. range (road): 210km (130 miles)
Max. range (off-road): 120km (75 miles)
Trench-crossing capability: 2m (6.56ft)
Fording capability: 0.1m (0.33ft)
Vertical step: 0.8m (2.62ft)
Armour: 30mm (1.18in) front plate/front turret; 14.5mm (0.57in) sides; 8mm (0.31in) rear
Main armament: 37mm Vickers-Terni L/40
Secondary armament: 2 × 8mm Breda 38 machine guns
Stowed main gun rounds: 84
Stowed machine gun rounds: 2,808

TANK DETAILS



M11/39, EGYPT, SEPTEMBER 1940

In 1940, all available M tank battalions were sent to Egypt, forming what would become the special or ‘Babini’ tank brigade. First to be sent were the I and II Battalion of the ‘Ariete’ division’s 32° Reggimento. The former had its tanks camouflaged overall in sand with a geometric splinter green pattern, unusual for Italian armour. The battalion also used to have the Italian flag’s colours painted on the back of the tank turrets, as a recognition symbol.



M13/40, LIBYA, JANUARY 1941

Facing the British offensive in winter 1940–41, all available M tanks were sent to Libya to try to halt the advance into western Cyrenaica. In January 1941, single M13/40 tanks were used to re-equip the XXI Light Tank Battalion, whose crews escaped from Tobruk after the loss of their vehicles. Hastily formed, the new tank battalion went into battle and was destroyed at Beda Fomm early in February, its tanks still painted in the standard grey-green camouflage.

THE M14/41 MEDIUM TANK

Improvements to the M13/40's cooling systems and filters only partially solved the shortcomings demonstrated during the first trials on the battlefield in North Africa, the main one being its underpowered engine. In spring 1941 experiments were made in Libya, first fitting an M13/40 with a petrol-fuelled engine, then in June with a new diesel oil engine providing 20 more horsepower and with improved starter, new air and diesel oil filters, rearranged electrical apparatus and new rechargeable batteries. The eight-cylinder SPA 15T M41, 145hp engine increased tank speed to 33km/h (20.5mph) on road, 16km/h (10mph) off-road, without altering the overall structure and performance of the M13/40 tank.

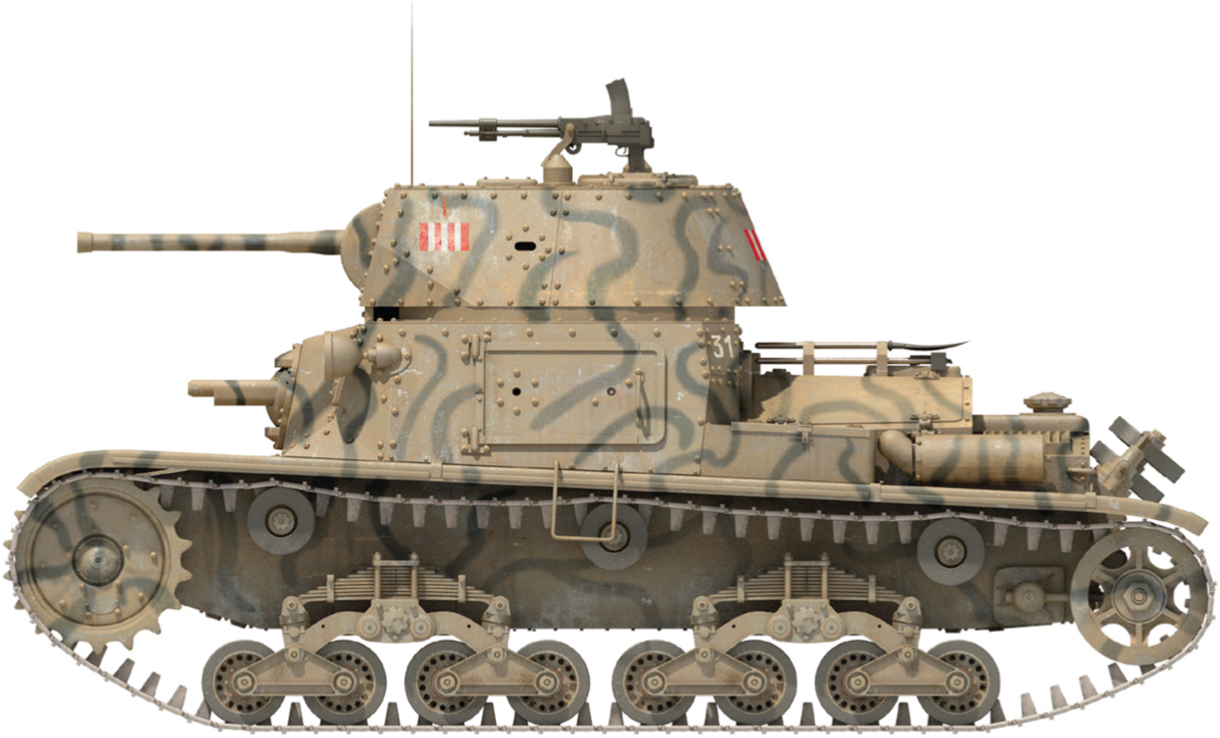
Production of this new batch was named M14/41 after weight and year of production (this classification system was officially abolished in August 1942, leaving only the type of the tank and its year of production, such as M40 and M41; unofficially, the old system remained in use). The improved M14/41 was characterized by reinforced fenders running all along its length, different transversal outlet radiator grilles, mud-removing levers positioned right behind the sprocket wheels and, in the last production units, 20-litre (4.4-gallon) can supports (usually four at the rear – two for water, one for fuel and one for lubricant – and two or three on the sides, generally the left). Ammunition storage was increased again, with a total of 87 rounds for the 47/32.

Although mechanical reliability was improved on the M14/41, without altering its most serious shortcomings, the increase in weight greatly reduced the effects of the new, more powerful engine. Furthermore, when it first made its appearance on the battlefield in late 1941, the M14/41 was already outdated because of insufficient gunnery and inadequate armour. A total of 695 M14/41 were produced, from August 1941 to late 1942. In October 1942 the army put in an order for 280 of the newer M15/42, while the production of the M14/41 was being halted and the new P40 heavy tank was also being developed, intended to equip tank units in 1943.

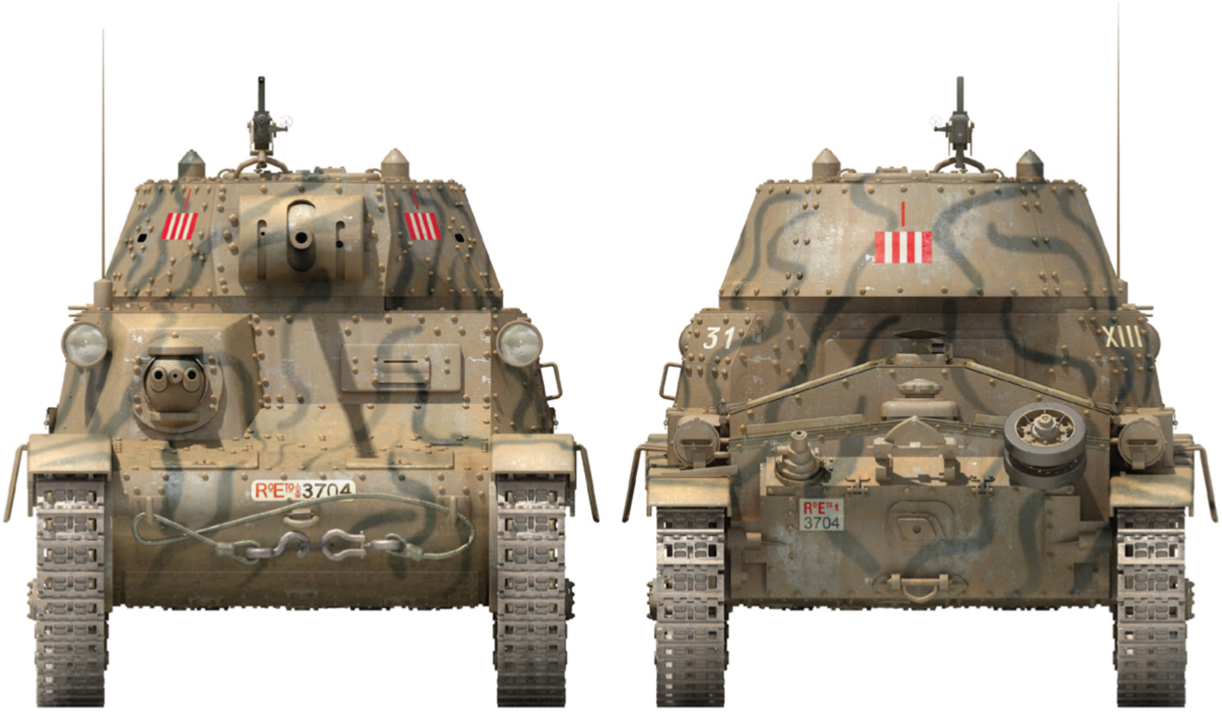
SPECIFICATIONS

Crew: 4
Weight: 14 tonnes (15.43 tons)
Power-to-weight ratio: 10hp/ton
Overall length: 4.92m (16.14ft)
Overall width: 2.28m (7.48ft)
Overall height: 2.37m (7.77ft)
Ground pressure: 0.94kg/cm^2 (13.37psi)
Ground clearance: 0.41m (1.34ft)
Engine: SPA 15T, 145hp at 1,900rpm
Transmission: Monodisc, 4 forward, 1 reverse
Fuel capacity: 227 litres (60 gallons)
Max. speed (road): 33km/h (20.5mph)
Max. speed (off-road): 16km/h (10mph)
Max. range (road): 200km (124 miles)
Trench-crossing capability: 2.1m (6.98ft)
Fording capability: 1m (3.28ft)
Vertical step: 0.8m (2.62ft)
Armour: 30–42mm (1.18–1.65in) front; 25mm (0.98in) sides/rear; 6–15mm (0.24–0.59in) floor/roof
Main armament: 47mm Model 37 L/32 Ansaldo
Secondary armament: 4 × 8mm Breda 38 MG
Stowed main gun rounds: 87
Stowed machine gun rounds: 2,592

TANK DETAILS



M14/41, EGYPT, AUTUMN 1942



M14/41, EGYPT, AUTUMN 1942

In September–October 1942 XIII M Tank Battalion of the 31° Reggimento Carri of the ‘Centauro’ armoured division was moved to the Western Desert newly equipped with the M14/41. The battalion would eventually be attached to the ‘Ariete’ armoured division, replacing the disbanded VIII Battalion of ‘Ariete’s’ 132° Reggimento Carri, although the tanks retained the original regimental number on the rear side of the fighting compartment along with the battalion number (left and right). The M14/41 could be distinguished from the M13/40 by the elongated fenders, also used on the first production batch of the M13/40, but in this case with the jack carried on the front left fenders (the M14/41 carried it on the rear hull). Only a few units camouflaged their tanks with green or brown stripes over the standard sand colour, particularly the last ones to arrive in the Western Desert.

THE TYPE 95 HA-GO

In July 1933, Japan's infantry and cavalry schools completed a design study for a new light tank based on features of two existing designs. The new tank weighed about 7 tonnes (7.7 tons) and was armed with a 37mm gun. It was powered by the same diesel engine as the Type 89B but weighed only half as much, offering better road speed. Construction was handed over to Mitsubishi, and a prototype began trials in June 1934. The design was so satisfactory that it was accepted for production as the Type 95 Ha-Go light tank.

The Type 95 Ha-Go followed the classic layout of Japanese tanks, with the asymmetric turret and rear machine-gun position. The prototypes were armed with a 37mm gun in a one-man turret, but before large-scale production commenced they were modified to include a separate ball-mounted machine gun in an extension on the right rear side of the turret, patterned after the Type 89B turret. This modification allowed the tank commander to use either the 37mm gun or the machine gun, depending on the mission, by traversing the appropriate weapon forward. In early production tanks deployed to Manchuria, the vehicle had poor performance when moving across farm fields planted with *kaoliang* (sorghum), because the distance between the furrows coincided with the spacing between the tanks' road wheels. To prevent this problem, a small wheel was suspended at the centre of each bogie. A portion of the Type 95 production run was manufactured with this 'Manchurian' suspension, but the majority was built with the standard design.

The Type 95 Ha-Go was a good tank for its era (i.e., the mid-1930s) and perfectly fulfilled the role of supporting the infantry that it was designed for. In the Pacific theatre, it matched its light American counterparts of the time, the M2 and M3 light tanks, which were of similar design and technical capacity. However, the Type 95 was emphatically outclassed by the US medium tank M4A2.

SPECIFICATIONS

Crew: 3

Combat weight: 6.9 tonnes (7.6 tons)

Power-to-weight ratio: 16.2hp/ton

Overall length: 4.38m (14.36ft)

Width: 2.06m (6.75ft)

Height: 2.15m (7ft)

Ground pressure: 0.61 kg/cm^2 (8.7psi)

Ground clearance: 39cm (15in)

Armour: 9mm–12mm (0.39–0.47in)

Max. speed (road): 48km/h (30mph)

Max. speed (off-road): 26km/h (16mph)

Max. range: 250km (110 miles)

Trench-crossing capability: 2m (6.5ft)

Fording capability: 1m (3.28ft)

Vertical step: 0.6m (1.96ft)

Engine: Mitsubishi NVD 6120, 6-cylinder, air-cooled, 120hp

Fuel capacity: 109 litres (29 gallons)

Transmission: 4 forward, 1 reverse

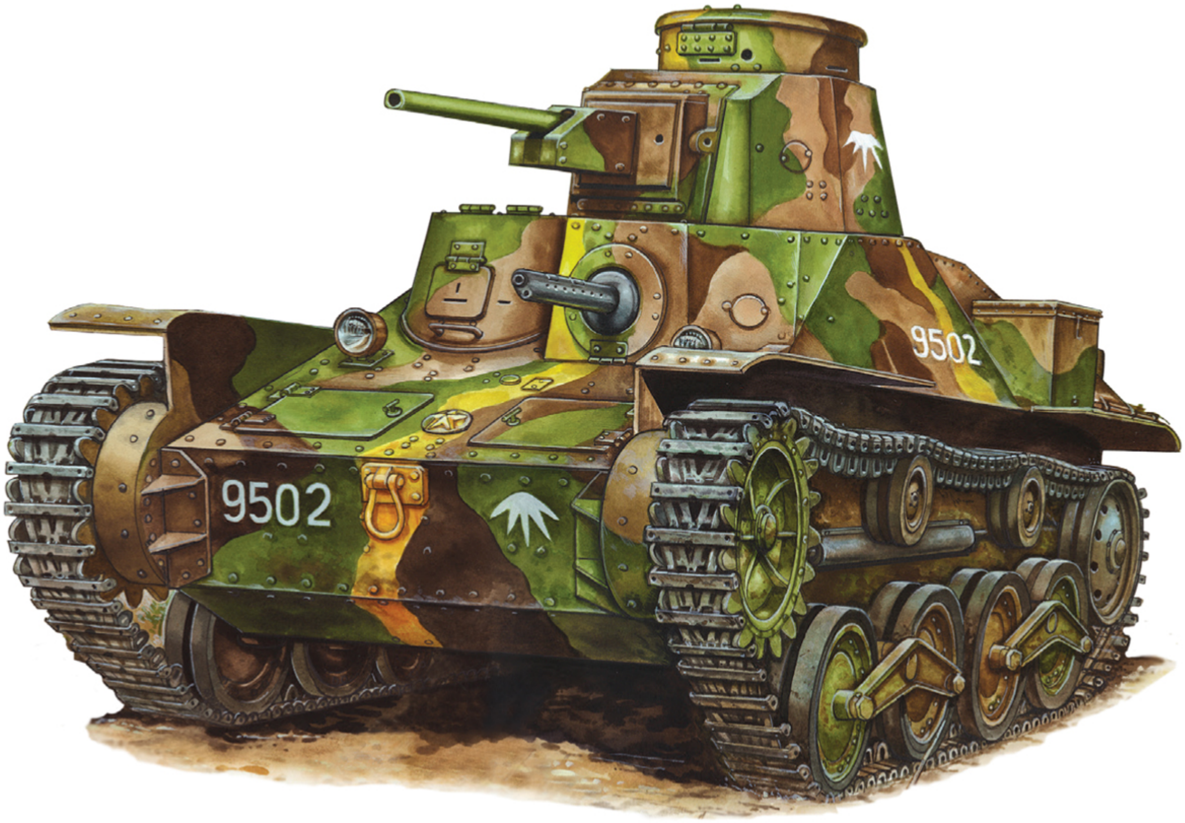
Main armament: 37mm Type 94 or Type 98 (later models)

Secondary armament: 2 × 7.7mm Type 97 machine guns

Stowed main gun rounds: 121 (Type 94 gun) or 122 (Type 98 gun)

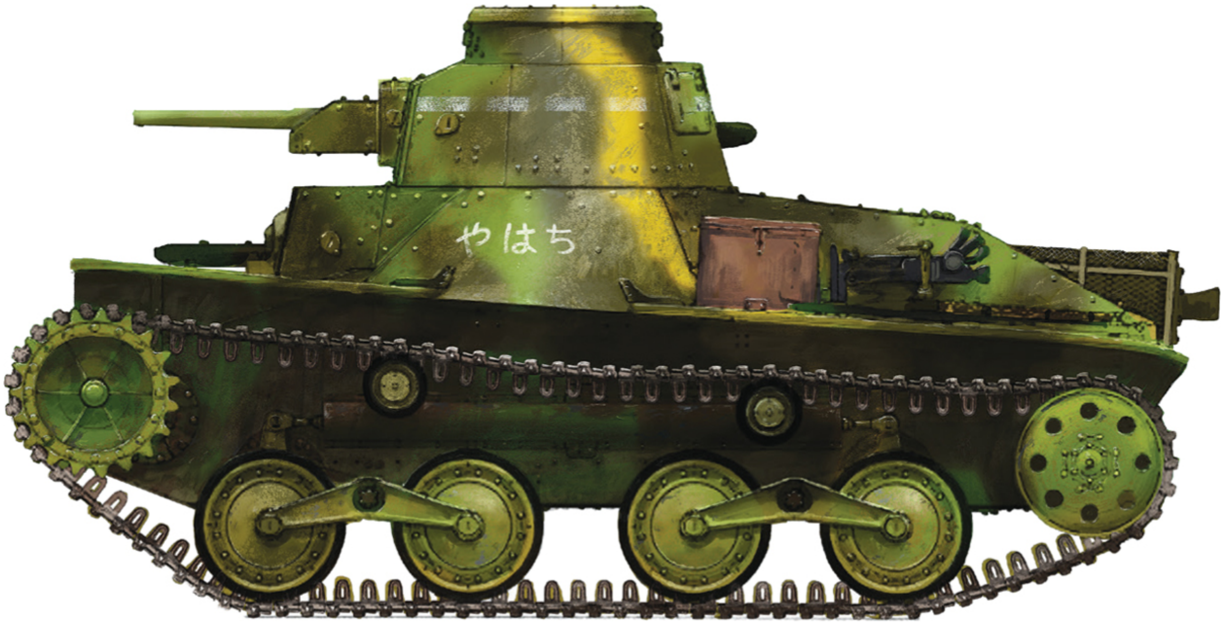
Stowed machine gun rounds: 2,740

TANK DETAILS



TYPE 95 HA-GO, PHILIPPINES, 1941

When the Japanese 7th Tank Regiment was assigned to the Luzon strike force, its markings and camouflage remained essentially the same as in China. The newer Type 95 light tank was painted in the more common three-colour scheme of artillery brown, dark olive green, and dark mahogany brown with the characteristic yellow stripe. On the Type 95, the company insignia was painted on the turret and the tactical number on the hull side, and repeated on the lower bow.



TYPE 95 HA-GO, GUAM, 1942

Shown here is an early production Type 95 Ha-Go from the 9th Regiment on Guam. The tank was crewed by three men: two in the hull and one in the turret. The only negotiable access to the crew compartment was the tank commander's hatch on the top of the turret. The driver's controls were located on the right-hand side of the hull; the assistant driver sat on the left-hand side of the tank's hull. He operated a ball-mounted 7.7mm machine gun and doubled as a mechanic.

THE TYPE 97 CHI-HA

Although the Type 89 formed the backbone of the tank force in China, by 1935 it was widely recognized to be obsolete, particularly in terms of its limited road speed. A new medium tank design began in 1935, partly inspired by news of the British A6 tank with a 47mm gun. The main emphasis of the new design was to increase the tank's speed to keep up with new light tanks such as the Type 95. The armament was the low-velocity 57mm gun used on the Type 89. Armour protection remained light due to the army's desire to keep the weight, and hence the cost, to a minimum. The thickest armour on the tank was the gun mantlet at 33mm (1.29in), and the turret sides at 26mm (1in). The remaining panels ranged from 20mm (0.79in) on the hull superstructure to 12mm (0.47in) on upper surfaces. The fabrication was entirely riveted. While not unusually thin by mid-1930s' standards, its armour protection became increasingly vulnerable after the war expanded in 1941.

Two Mitsubishi designs were considered: the Chi-Ha, powered by a 170hp diesel, and the lighter and cheaper Chi-Ni, powered by a 135hp diesel. The decision between the two alternatives came in the summer of 1937 after the outbreak of war with China. Because the military budget had been greatly expanded, the Imperial Japanese Army supported the more capable of the two designs, opting for the Chi-Ha configuration for the new Type 97 medium tank. The Type 97 Chi-Ha inherited the suspension developed for the Type 95 light tank, but it featured six road wheels instead of four. Four men occupied the vehicle, with a driver and bow machine-gunner in the hull and two men in the turret. Production began in 1938. From 1942, an improved variant – the Type 97 Kai Shinhoto Chi-Ha – was introduced, with a new enlarged turret with the more effective 47mm tank gun. A further modernization went into production in 1943: the Type 1 Chi-He. This was an attempt to modernize the Chi-Ha using more resilient welded armour and a more powerful motor, but it did not see combat use.

SPECIFICATIONS

Crew: 4

Weight: 15.8 tonnes (17.4 tons) combat loaded

Overall length: 5.5m (18ft)

Width: 2.33m (7.64ft)

Height: 2.38m (7.81ft)

Ground pressure: 0.62kg/cm^2(8.83psi)

Ground clearance: 0.4m (1.3ft)

Armour: 33mm (1.3in) turret front; 26mm (1.02in) turret sides; 25mm (0.98in) hull front; 26mm (1.02in) hull sides; 20mm (0.79in) hull rear

Engine: Mitsubishi SA12200VD air-cooled V-12 diesel

Transmission: clutch-brake steering with 4 forward and 1 reverse gears

Max. speed: 38km/h (23.6mph)

Max. range: 210km (130.4 miles)

Fuel consumption: 15 litres (3.9 gallons) per hour

Trench-crossing capability: 2.5m (8.2ft)

Fording capability: 1m (3.28ft)

Vertical step: 0.9m (2.95ft)

Armour: 25mm (0.98in) turret front; 30mm (1.18in) gun mantlet; 25mm (0.98in) hull front; 20mm (0.8–0.79in) hull sides

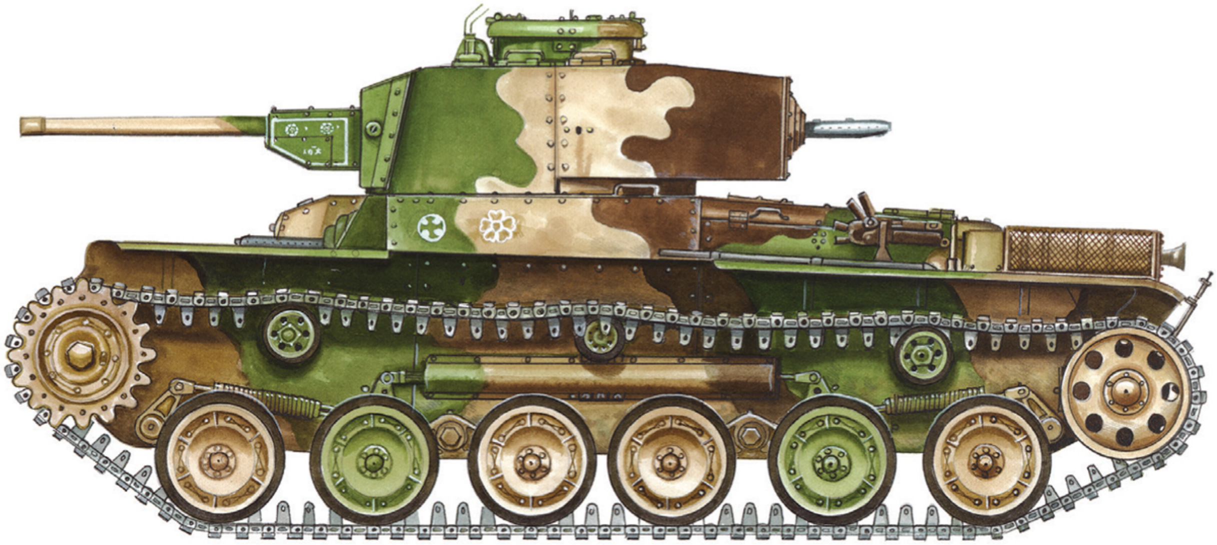
Main armament: Type 1 47mm L/48 Gun

Secondary armament: 2 × Type 97 7.7mm machine guns

Stowed main gun rounds: 120

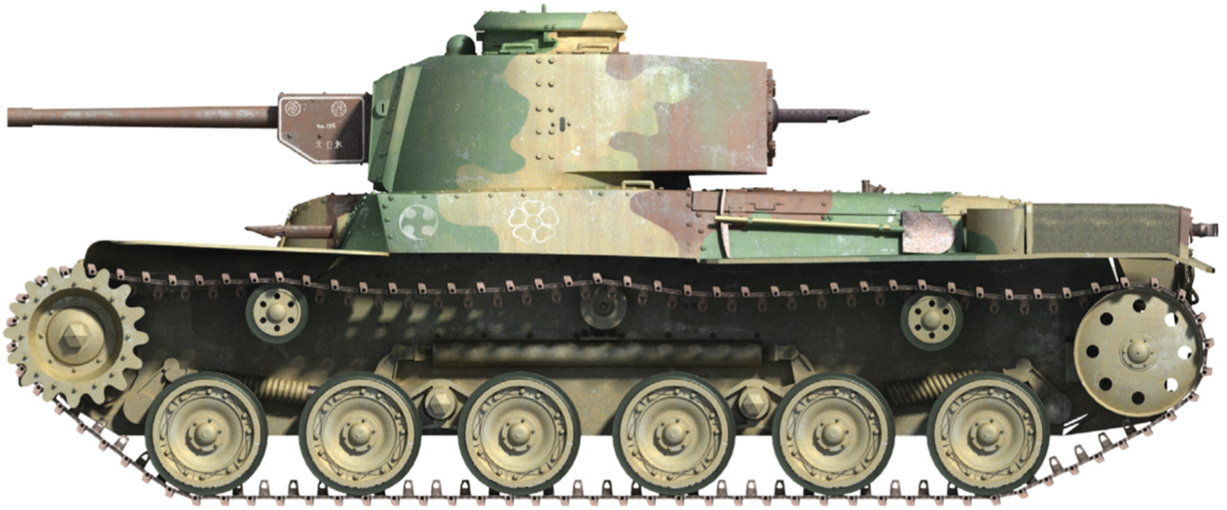
Stowed machine gun rounds: 2,745

TANK DETAILS



TYPE 97-KAI SHINHOTO CHI-HA, PHILIPPINES, DECEMBER 1944

This Shinhoto Chi-Ha is in the standard 1942 finish of overall parched grass with bands of willow green and mahogany brown. The marking in front of it is the traditional ‘Tomoe’ design, derived from the family crest of Oishi Kuranosuke, leader of the legendary 47 *ronin* warriors of 1702. On the side of the gun cover is an Ai-koku presentation marking, consisting of two stylized circular characters above, ‘No. 125’ in the centre, and the symbols for *Dai Nippon* (Greater Japan) below.



TYPE 97-KAI SHINHOTO CHI-HA, 1945

The Type 97-Kai Shinhoto Chi-Ha began appearing in combat in increasing numbers in 1944. It carried 104 rounds of 47mm ammunition. There were five ready rounds on the right and left sides of the turret front, and a 30-round bin in the right turret bustle. The two main hull stores were a 30-round bin in the left rear corner behind the loader, and four smaller bins above the power train and in the sponsons.

THE 7TP

The 7TP was developed to correct the deficiencies of the Vickers E. The first prototype was completed in 1934, with series production authorized later that year as the 7TP (7 Ton Polish). Compared with the Vickers, the 7TP had thicker armour, an upgraded version of a license-produced Swiss Saurer diesel engine, a redesigned clutch and gearbox, and a strengthened Vickers-Armstrong suspension. The first series-production 7TPs were armed with twin Vickers machine guns, but this was only an interim measure pending introduction of a more modern single-turret design with a capable anti-tank weapon. After evaluating a number of different armament options in the mid-1930s, the Poles selected the Swedish Bofors 37mm.

In September 1939, the month in which Germany invaded Poland, 7TPs equipped the 1st and 2nd Light Tank Battalions assigned to Reserve Army Prussia. There were also two companies subordinate to the Warsaw Defence Command, one equipped with 11 single-turret tanks and the other with seven twin-turret and four single-turret tanks. Reserve Centre No. 3 fielded a provisional unit equipped with eight twin-turret 7TPs.

The battalions moved repeatedly as the Polish defence progressively collapsed. Applied piecemeal in companies and platoons to strengthen threatened sectors, groups of 7TPs often fought in relative isolation and disunity, which was exacerbated by a lack of radios. They suffered mounting losses in fierce engagements against German armour; although the tank’s armour had been slightly increased over that of the Vickers E, it still remained vulnerable. Many were also lost from mechanical breakdowns during the march to action, especially as maintenance personnel were in short supply. But courageous crews also achieved some victories. On 18 September, for example, the 1st Battalion conducted a successful attack, destroying six German tanks, four armoured cars and a number of anti-tank guns and howitzers. But with Polish air assets largely destroyed early, 7TP formations had little chance to affect the operational course of a battle.

SPECIFICATIONS

Crew: 3

Weight: 9.9 tonnes (10.9 tons)

Power-to-weight ratio: 11.1hp/ton

Overall length: 4.6m (15ft)

Overall width: 2.4m (7.87ft)

Overall height: 2.3m (7.55ft)

Ground pressure: 0.60kg/cm^2 (8.54psi)

Ground clearance: 0.32m (1.05ft)

Engine: PZInz.235(Saurer VBLDd) liquid-cooled inline 6-cylinder 4-stroke direct injection diesel

Transmission: dry multidisc gearbox; 4 forward, 1 reverse

Fuel capacity: 110 litres (29 gallons) + 20 litres (5 gallons) reserve

Max. speed (road): 37km/h (23mph)

Max. speed (off-road): 32km/h (20mph)

Operational range: 150km (93 miles)

Trench-crossing capability: 1.8m (5.9ft)

Fording capability: 1m (2.3ft)

Vertical step: 0.75m (2.5ft)

Armour: 17mm (0.67in) glacis; 14.5mm (0.57in) hull face; 13mm (0.51in) hull sides; 5mm (0.20in) hull rear; 14.5mm (0.57in) turret face; 15mm (0.59in) turret rear and side; 10mm (0.39in) turret roof

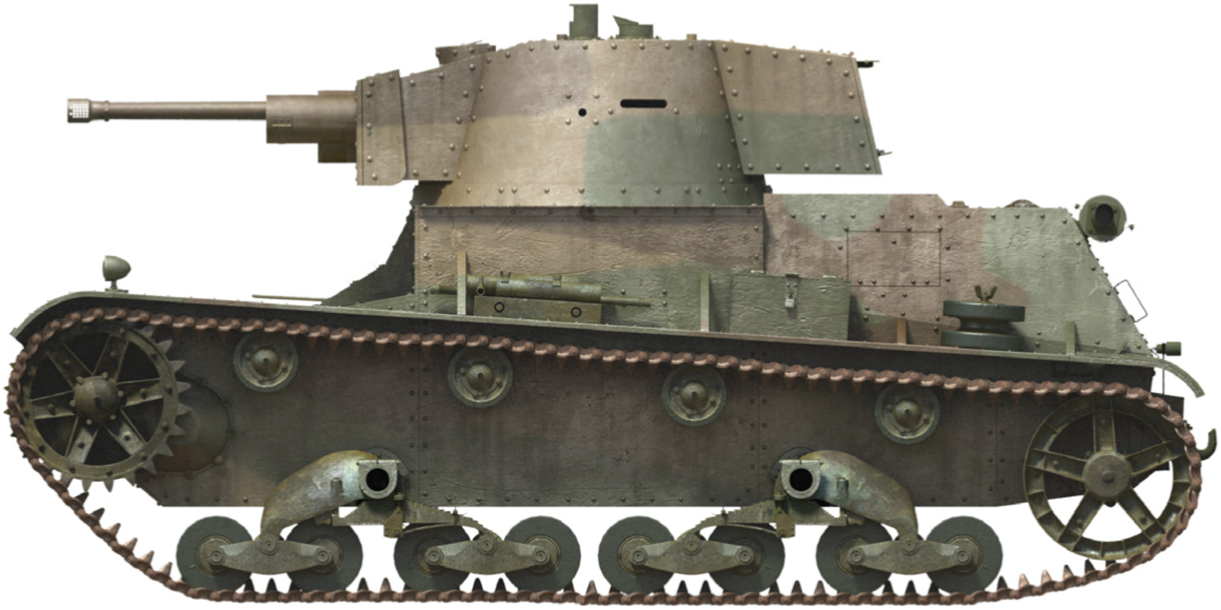
Main armament: 1 × 37mm Bofors wz.37 L/45

Secondary armament: 1 × 7.92mm Ckm wz.30 MG (co-axial)

Stowed main gun rounds: 80

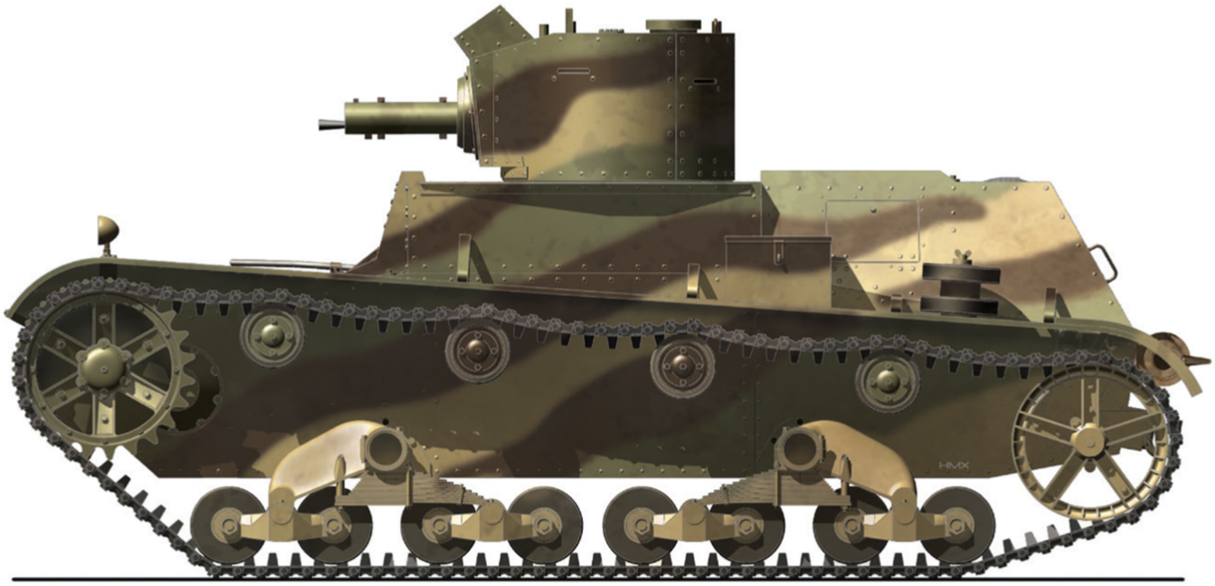
Stowed machine gun rounds: 3,960

TANK DETAILS



7TP, 2ND LIGHT TANK BATTALION, 1939

The 7TP sported several camouflage schemes consisting of brown, sand and olive green, although dark grey was occasionally used. ‘Horizontal’ and ‘chequerboard’ patterns were also common. Insignia and markings were normally removed in combat conditions, but in peacetime Polish reconnaissance and light tanks used geometric tactical symbols to identify command and unit vehicles. A white circle, white triangle and red triangle respectively signified 1st Platoon, 2nd Platoon and 3rd Platoon.



TWIN-TURRET 7TP, 1939

This shows the twin-turret 7TP armed only with machine guns. Twenty-three examples of this version were built: one was a conversion of a twin-turret Vickers E to 7TP standards, and the other 22 were built as 7TPs. The Hotchkiss machine guns originally mounted in the twin-turret Vickers E have been replaced by the more reliable Brownings fitted with light armoured covers over the water-cooling jackets. Despite the archaic twin-turret layout, it remained in service throughout the campaign.

THE T-26

The Vickers 6-ton tank was the most influential tank design of the inter-war years. It was exported to numerous countries and inspired many tank designs. Most importantly, it was license-produced in the USSR as the T-26 light tank. More T-26 tanks were manufactured than any other tank of the 1930–40 era, and more were produced than the combined French and German tank production during this decade. Its combat debut in the Spanish Civil War sealed its reputation as the premier tank of the inter-war years.

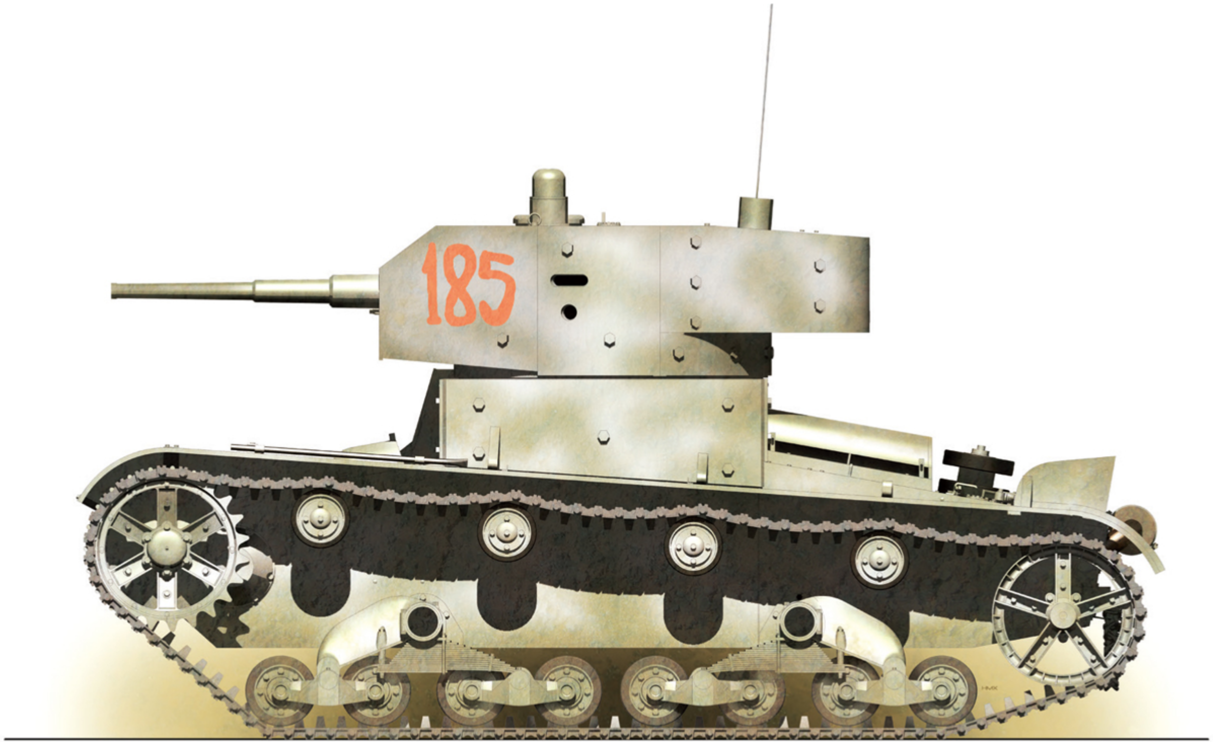
Entering production in 1931, the T-26 initially had a twin-turret configuration, each turret carrying a single Degtyarev DT machine gun. Armour plate was light, giving protection from small-arms fire only. In 1933, however, the T-26 mod. 1933 variant was introduced, featuring a single turret mounting a 45mm 20K gun and a single DT machine gun. This was the most numerous of the manufactured variants, but subsequent variants included the mod. 1938 (although not an official designation), which had a redesigned turret, improved fuel capacity and better gun-sighting arrangements, plus fire-support versions, radio vehicles and flamethrower tanks.

In the Spanish Civil War, fighting on the Republican side, the T-26 proved superior to the German PzKpfw light tank, since the latter was unable to disable the T-26, while the T-26 could easily penetrate the thin armour of the German tank. World War II, however, exposed the increasing obsolescence of the type. The T-26 light tank made up the bulk of the Red Army tank force on 22 June 1941, at the time of the German invasion. By this time, the T-26 was past its peak, and the Soviet tank fleet was further debilitated by maintenance problems and poor training. The enormous tank park largely evaporated under the merciless advance of the German blitzkrieg. Small numbers of T-26 tanks continued to soldier on in 1942, but they became increasingly rare on the Russian battlefield. Several hundred T-26 tanks remained isolated in the Soviet Far East, and these did see a brief moment of glory in the final campaign against the Japanese Army in Manchuria in August 1945.

SPECIFICATIONS

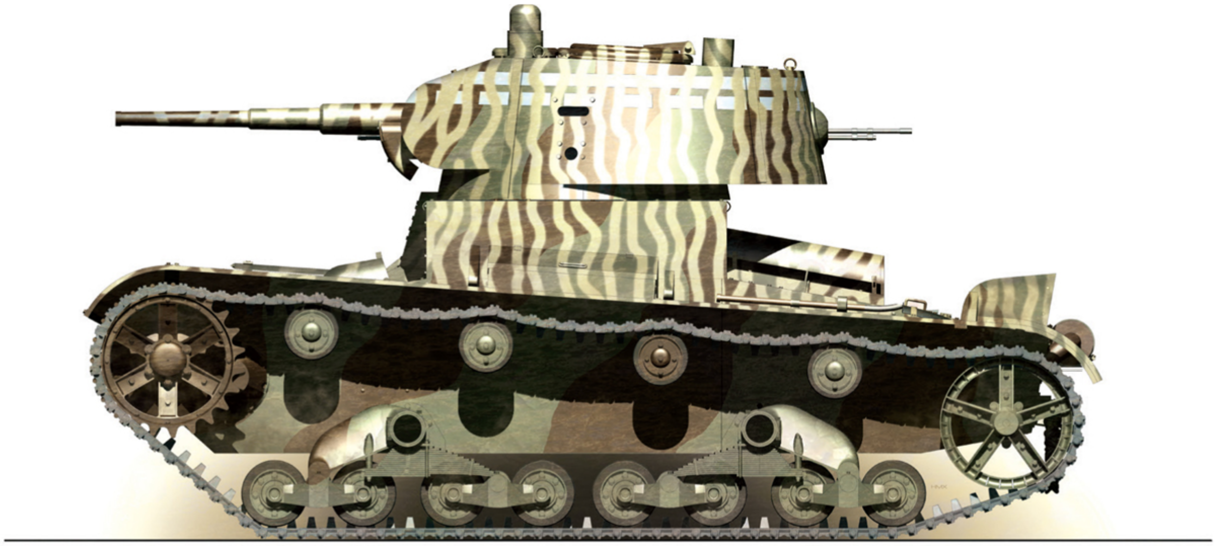
Crew: 3
Weight: 9.6 tonnes (10.58 tons)
Power-to-weight ratio: 9.6hp/ton
Overall length: 4.8m (15.75ft)
Overall width: 2.44m (8ft)
Overall height: 2.24m (7.35ft)
Ground pressure: 0.61 kg/cm^2(8.68psi)
Ground clearance: 0.38m (1.25ft)
Engine: 96hp, 4-cylinder, air-cooled petrol
Transmission: 5 forward, 1 reverse
Fuel capacity: 285 litres (75 gallons)
Max. speed (road): 30km/h (18.64km/h)
Max. range (road): 180km (112 miles)
Max. range (off-road): 120km (74.5 miles)
Trench-crossing capability: 1.8m (5.9ft)
Fording capability: 0.8m (2.6ft)
Vertical step: 0.7m (2.3ft)
Armour: 6–15mm (0.24–0.59in)
Main armament: 45mm Gun Model 32 L/46
Secondary armament: 2–3 × 7.62mm DT MG
Stowed main gun rounds: 100
Stowed machine gun rounds: 3,654

TANK DETAILS



T-26 MODEL 1933 ('EKRANOVKA'), LENINGRAD, 1944

One of the main tactical shortcomings of the T-26 was its thin frontal armour. In 1941, several factories began steps to improve the armour on the tanks. This particular variant avoided the problems of trying to fit armour plate over the curved surfaces of the turret front by building out the entire front turret structure. It was painted in a simple whitewash over the usual 4BO green, and carries tactical markings in red.



T-26 MODEL 1938, CRIMEAN FRONT, 1942

This is an example of one of the variations in camouflage scheme in a brigade formerly part of the 6th Tank Division, 28th Mechanized Corps, after it had been withdrawn from Iran and re-organized. The base 4BO colour of the tank has a pattern of 6K brown bands, along with the battalion/company bands in white. This has been over-painted by a pattern of 7K earth yellow, partly covering the old battalion/company bands.

THE BT FAST TANK

The BT series of tanks were a curious amalgam of American and Soviet technology. Although originally based on the imported US Christie convertible tank, the Soviet versions quickly departed from the American originals, particularly in terms of armament. They were selected by the Red Army as the basis for their new mechanized forces, and were built in larger numbers than any tank of the 1930s except for their stable-mate, the Soviet T-26 infantry tank.

A unique feature of the BT series was the Christie convertible suspension, which took up a significant amount of internal hull volume, leading to a very cramped interior. In this system, the tracks could be removed and the tank driven on its road wheels. This conversion was mainly intended for long road marches, since the wheeled configuration used less fuel and put less strain on the engine.

The first production iteration of the BT-7 was the Model 1935, but improvements in design led to the Model 1937. This tank shared the same overall layout as the original Christie tank but was substantially different in most details. The turret was dominated by the 45mm 20K Model 1934 gun with its associated co-axial DT machine gun on the right side. This was a conventional tank gun with a fast-action drop-breech and had a maximum rate of fire of 15–20 rounds per minute. There was a circular Ventipane ceiling fan above the gun to extract cordite fumes, but the turret became unbearably smoky during prolonged gun use, which could lead to crew asphyxiation.

Due more to poor training, poor tactics and operational incompetence than deficiencies in the vehicles, the large fleet of BT tanks was largely destroyed in the great tank battles in the summer of 1941. Limited numbers of BT tanks survived into the 1942 campaigns, and there was small-scale use in the Far East in 1945. Aside from being an important design in its own right, the BT series is perhaps best remembered as the forerunner of the legendary T-34 tank.

SPECIFICATIONS

Crew: 3

Weight: 13.8 tonnes (15.2 tons)

Power-to-weight ratio: 32.8hp/ton

Overall length: 5.66m (18.57ft)

Overall width: 2.23m (7.32ft)

Overall height: 2.42m (7.94ft)

Ground pressure: 0.74kg/cm^2 (10.53psi)

Ground clearance: 0.3m (0.98ft)

Engine: M-17T, 12-cylinder V profile, B-70 aviation fuel nominal 400hp, maximum 500hp

Transmission: 3 forward, 1 reverse

Fuel capacity: 650 litres (171 gallons) internal + 128 litres (34 gallons) in four external tanks

Max. speed (road): 52km/h (32mph) on tracks; 72km/h (45mph) on wheels

Max. speed (off-road): 32km/h (20mph) on tracks

Max. range (road): 375km (233 miles) on tracks; 500km (311 miles) on wheels

Max. range (off-road): 160km (99 miles) on tracks

Trench-crossing capability: 2m (6.56ft)

Fording capability: 1.2m (3.94ft)

Vertical step: Up to 0.75m (2.46ft)

Armour: 22mm (0.87in) hull front; 13mm (0.51in) hull sides and rear; 15mm (0.59in) turret front and rear; 13mm (0.51in) turret sides

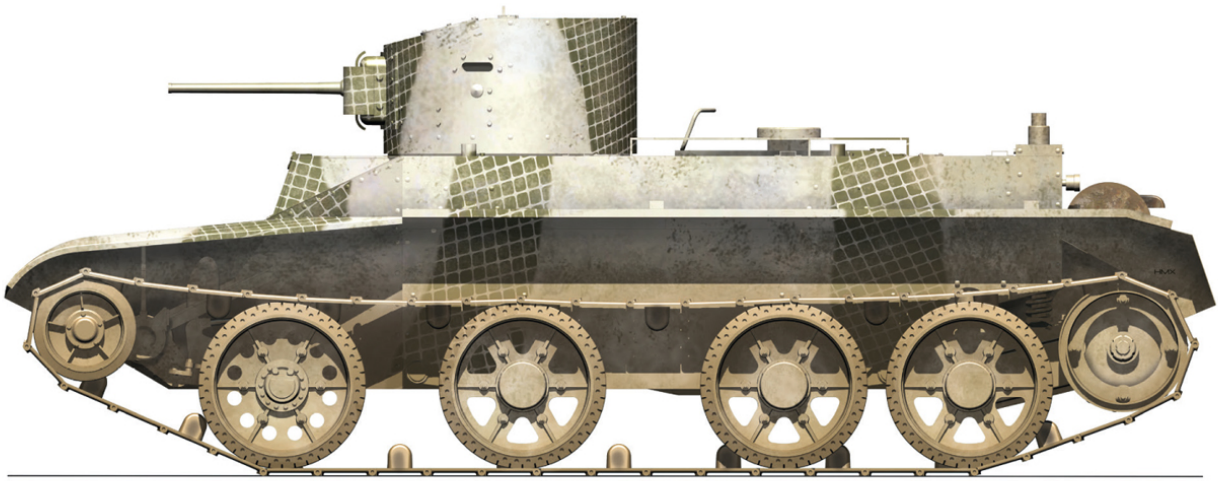
Main armament: 45mm 20K Model 1938 tank gun

Secondary armament: 7.62mm DT Degtarev tank machine gun

Stowed main gun rounds: 188

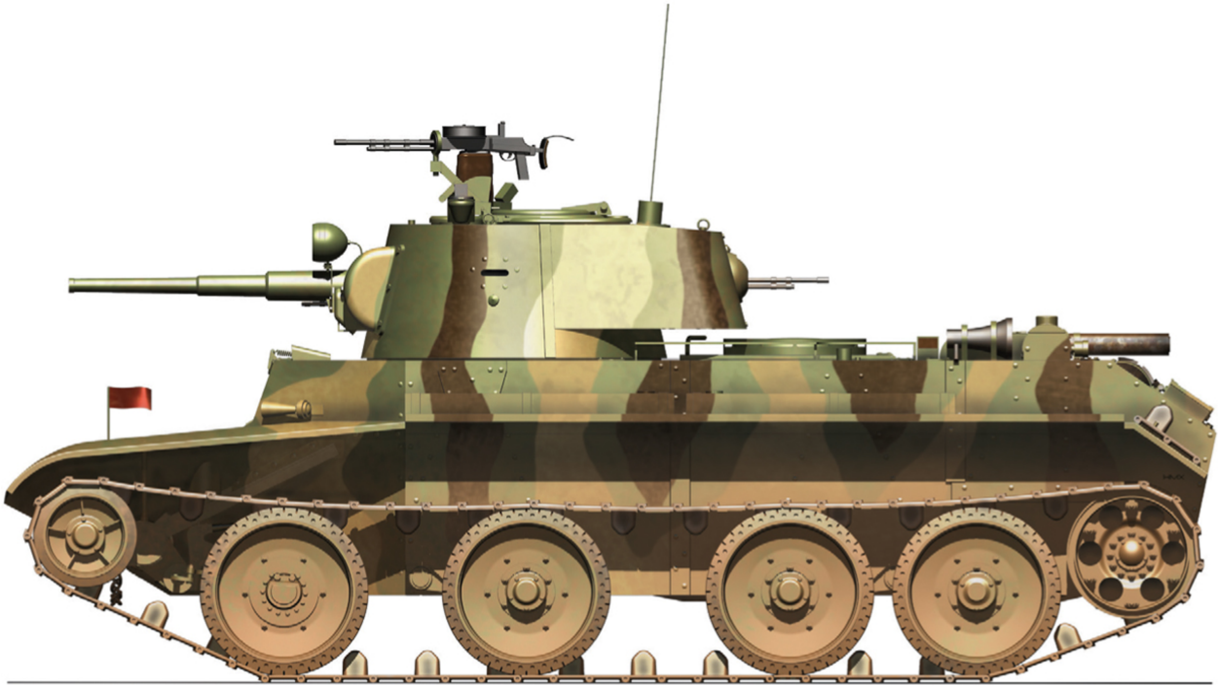
Stowed machine gun rounds: 2,394

TANK DETAILS



BT-7 MODEL 1932, 128TH TANK BRIGADE, MOSCOW AREA, NOVEMBER 1941

In the wake of the Finnish War of 1939–40, the NIIBT at Kubinka developed a special winter camouflage scheme consisting of broad bands of whitewash over the usual summer camouflage green. The bands of green were supposed to be broken up by a cross-hatch pattern of thin stripes. This scheme was used in the winter of 1941–42. It was seldom seen afterwards, even though a January 1943 issue of the journal of the Red Army Armoured Force continued to recommend its use for winter camouflage.



BT-2 MODEL 1937, POLAND, SEPTEMBER 1939

In 1939, a set of recommendations were established for the camouflage painting of armoured vehicles. Units in Group 1 (northern USSR) were to use two or more colours including 4BO green, 6K dark brown, sand, and 7K earth yellow; Group 2 (southern European USSR) were to use green with a ‘sea-wave’ pattern of 7K earth yellow; Group 3 (Central Asia) were to use brown and sand; Group 4 (Far East) were to use green and dark brown. These rules were not rigidly applied, and this BT-7 tank shows a common scheme of 4BO green, 7K earth yellow and 6K dark brown.

THE KV-1 HEAVY TANK

The KV was born out of a desire following World War I for a heavy tank to assist in break-through operations. During the 1930s Russia experimented with several tank designs, but they were generally too heavy or impractical for use in combat. A May 1938 meeting led to a redesign of previous models, and the new tank was given the name 'KV', after Marshal Klimenti Voroshilov, the People's Defence Commissar. On 19 December 1939 the Defence Committee accepted the KV for service as the Red Army's new heavy tank. An initial production batch of 50 tanks was ordered for delivery in 1940 with a redesigned turret.

The German Wehrmacht launched Operation *Barbarossa* on 22 June 1941. The next day, Panzer units faced KV tanks for the first time. The KV's heavy armour proved impervious to anything the Germans could fire at them. Not only were the 37mm tank guns of the PzKpfw 35(t)s ineffective, but more frightening was the fact that 75mm fire from 'Stubs' (PzKpfw IVs with short 75mm guns) – the most powerful weapon used on German tanks of the period – also proved ineffective. Some KVs simply crushed the enemy anti-tank guns by running them over, using the heavy weight of their vehicle as a weapon to make up for having no ammunition. Major General K. Rokossovsky recalled in his memoirs: 'The KV tanks literally stunned the enemy. They withstood the fire of every type of gun the German tanks were armed with. But what a sight they were on returning from combat. Their armour was pock-marked all over and sometimes even their barrels were pierced.'

In spite of the exceptional performance of the KV tanks on many individual occasions, their overall impact on the 1941 fighting was negligible. Their technical superiority could not overcome the overwhelming tactical and operational shortcomings of the Red Army. The most obvious problem was the lack of training for the crews, which compounded the frequent mechanical failures. At the time of their introduction, the average service life for new Soviet tanks was 1,000–1,500km (620–930 miles) before factory rebuilding was necessary.

SPECIFICATIONS

Crew: 5

Combat weight: 42.6 tonnes (47 tons)

Power-to-weight ratio: 10.6hp/ton

Hull length: 6.8m (22.3ft)

Overall length: 7m (23ft)

Width: 3.3m (10.8ft)

Engine: V-2K 4-stroke, V-type, 500hp at 180rpm, 38.8-litre diesel engine

Fuel capacity: 600 litres (158 gallons) internal

Transmission: dry multi-plate main clutch, sliding-mesh gearbox, multi-plate clutch braking turning mechanism; 5 forward, 1 reverse gears

Max. speed (road): 34km/h (21mph)

Max. speed (cross-country): 16km/h (10mph)

Max. range: 249km (155 miles)

Fuel consumption: 2.4 litres/km (1 gallon/mile)

Fording capability: 1.6m (5.2ft)

Armament: 76.2, ZIS-5 rifled tank gun, 42-cal long; three 7.62mm DT machine guns

Main gun ammunition: BR-350A armour-piercing; OF-350 HE/frag; Sh-350A shrapnel

Muzzle velocity: 655m/sec (2,150ft/sec) (BR-350A)

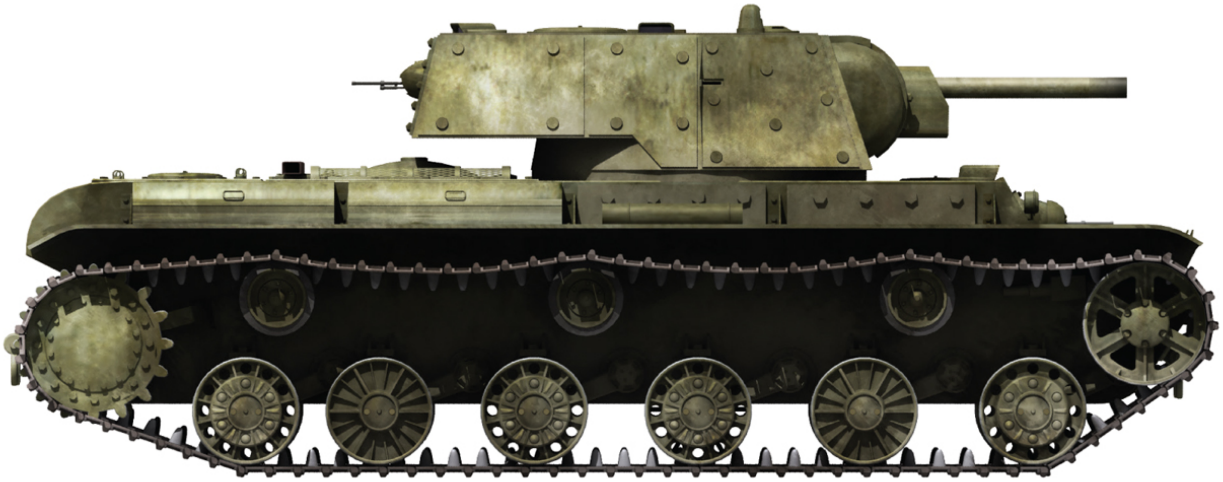
Max. effective range: 2.4km (1.5 miles)

Stowed main gun rounds: 135 rounds

Gun depression/elevation: -4 / +24 degrees

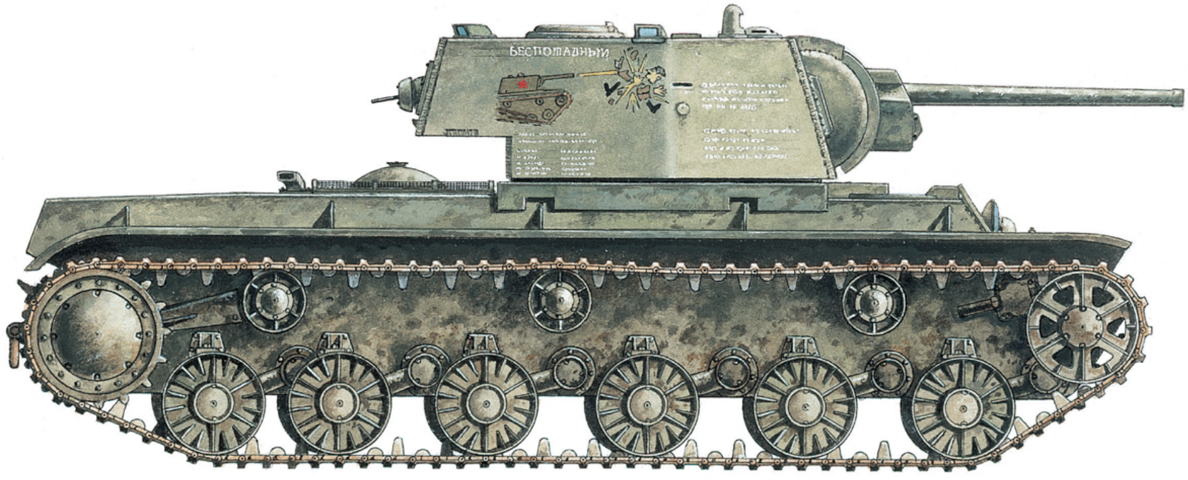
Armour: 75mm (2.95in) hull and glacis; 40mm (1.57in) belly; 32mm (1.26in) hull rear; 95–100mm cast (3.74–3.94in) turret front and sides; 30mm (1.18in) turret roof

TANK DETAILS



KV-1 MODEL 1940 'EKRANAMI'

Altogether, about 4,220 KV-1 and 204 KV-2 heavy tanks were built between 1939 and 1943. About 296 of the Model 40 KV-1s, the type seen here, were built from November 1940 to June 1941. The main improvement in this variant was the better 76.2mm F-32 gun. About one-third were built with additional bolt-on armour plates on the hull and turret, which increased protection up to 110mm (4.3in) but also raised the weight by 4 tonnes (4.41 tons).



KV-1 MODEL 1941 (UP-ARMOURED TURRET), 12TH TANK REGIMENT, 1ST MOSCOW MOTOR RIFLE DIVISION, AUGUST 1942

This KV-1 was commanded by Lieutenant Pavel Khoroshilov and was renamed ‘Bezposhadniy’ (‘Merciless’). It was paid for by contributions from Moscow artists who had won the Stalin Prize. During the presentation ceremony, it was colourfully marked and sported a large cartoon of a Soviet tank firing on Hitler.

THE T-34/76

The T-34 was the most influential tank design of World War II. When first introduced into combat in the summer of 1941, it represented a revolutionary leap forward in tank design. Its firepower, armour protection and mobility were superior to that of any other medium tank of the period, and it was the most widely produced Allied tank of the war. The inspiration for the T-34 came from lessons learnt during the Spanish Civil War, where the Soviet government had dispatched several shipments of tanks to Spain. Foremost was the need for more armour protection, as little had changed since World War I, and Soviet tanks were easily penetrated by German 37mm anti-tank guns. This lesson was reinforced in 1938 and 1939 during clashes with the Japanese Army.

German troops began encountering T-34 tanks from the first day of the Operation *Barbarossa* campaign. They came as a great shock to the German infantry, whose 37mm anti-tank gun projectiles simply bounced off the T-34's armour at ranges of over 300m. In their dispatches, German field commanders began to mention the 'tank terror' that struck the infantry when Red Army tanks appeared. Despite their great impact on morale, the T-34 crews were too inexperienced to use the new tank effectively. One crew, after being fired upon 23 times by a German anti-tank gun to little effect other than to jam the turret ring, didn't even manage to hit their opponent. Many T-34 crews, either through poor training or lack of ammunition, preferred crushing these guns under their tracks.

The heyday of the T-34 came in the summer of 1943, during the battles in the Kursk–Orel salient. By this time the tank had lost much of its technical superiority, but Soviet tactics were now much more sophisticated and crews were more skilled. Moreover, the Red Army had adopted a doctrine of using overwhelming numbers to defeat the better-quality German tanks. Although in one-on-one encounters the T-

34 usually came away worse off than its most common counterpart, the Panzer IV, the sheer number of T-34s on the battlefield meant that these tank formations were highly effective.

SPECIFICATIONS

Crew: 3

Combat weight: 25.4 tonnes (28 tons)

Power-to-weight ratio: 17.5–19hp/ton

Hull length: 6.1m (20ft)

Overall length: 6.73m (22.1ft)

Width: 2.92m (9.6ft)

Engine: V-2-34 diesel, 4-stroke, 12-cylinder, 500hp at 180rpm

Transmission: dry multi-plate main clutch, mechanical gearbox, one-stage side drives with side clutches and strap brakes, 4 forward, 1 reverse gears

Fuel capacity: 673 litres (148 gallons) internal plus two external 45-litre (10-gallon) fuel cells

Max. speed (road): 54.7km/h (34mph)

Max. speed (cross-country): 26–40km/h (16–25mph)

Cruising speed: 29km/h (18mph)

Max. range: 467km (290 miles)

Fuel consumption: 1.8 litres/km (0.65 gallons/mile)

Fording capability: 1.27m (4.2ft)

Armament: F-34 76.2mm tank gun (42 calibres long)

Muzzle velocity: 655m/sec (2,150ft/sec) (BR-350A APHE)

Max. effective range: 2.4km (1.5 miles)

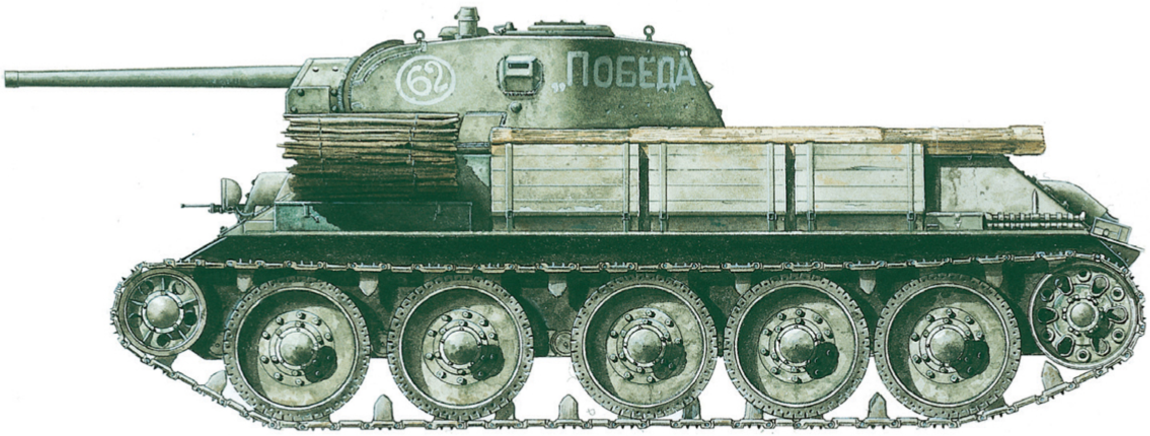
Stowed main gun rounds: 77 rounds

Gun depression/elevation: -3 / +30 degrees

Secondary armament: Degtaryev DT 7.62mm machine gun, co-axial DT 7.62mm machine gun

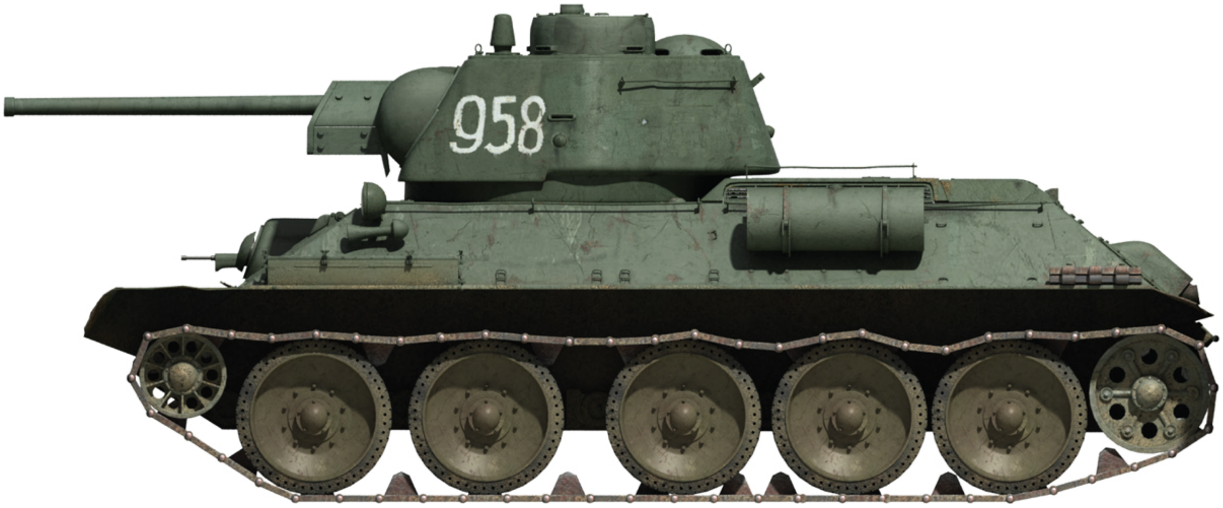
Armour: 47mm (1.85in) hull front; 45mm (1.77in) hull sides and rear; 65mm (2.56in) turret front and sides; 47mm (1.85in) turret rear

TANK DETAILS



T-34 MODEL 1941, SEPARATE TANK BRIGADE, AUTUMN 1941

During World War II, Soviet tanks were uniformly painted very dark green. Markings usually appeared in white. By August 1941, efforts were being made to increase morale. One aspect of this effort was the decision to encourage units to paint patriotic slogans on the sides of tanks. In this case, the Russian word is ‘Pobeda’, or ‘Victory’.



T-34 MODEL 1943, 1944

By the summer of 1944, there were two principal versions of the T-34 in service: the T-34/76 Model 1943 was armed with the 76mm F-34 gun introduced in 1941; the new T-34/85, featuring an enlarged turret and an 85mm gun, made its combat debut in March 1944. The Model 1943 had increased ammunition and fuel capacity over previous variants and a new hexagonal turret; the Germans called this variant ‘Mickey Mouse’ because of its appearance when its twin turret hatches opened.

THE T-34/85

The T-34/85 tank is one of those rare weapons that has remained in service for more than half a century. In mid-1943, the Red Army planned to replace the T-34 and KV with a new ‘universal tank’ that was the size of a medium tank, but with the armour of a heavy tank. The battle of Kursk ended this programme, since it revealed the need for better firepower rather than better armour. The T-34 follow-on, the T-43, was cancelled in favour of mounting a more powerful 85mm gun in a new, enlarged turret. The stillborn T-43 had introduced a three-man turret, and this served as the basis for the new T-34/85 turret.

First introduced in 1944, the T-34/85 was comparable in size, weight and firepower to the PzKpfw IV Ausf. J. Although the 85mm gun was a larger calibre than the PzKpfw IV’s 75mm gun, actual anti-armour performance was fairly similar as the German gun used a more powerful propellant charge relative to the weight of the projectile.

The Red Army began to receive the T-34/85 tank in March 1944. In general, preference was given to Guards formations. The aim was to completely re-equip each brigade with T-34/85s, but in fact many remained mixed formations with both the older T-34 and the newer tank. T-34/85s made their combat debut in late March 1944 during operations in western Ukraine. The tank’s arrival was a relief to Soviet tankers, for although the T-34/85 did not reverse the German technical advantage in tank armour and firepower, it nearly matched it. A major advantage the Soviet tank did have was in strength of numbers. At the end of May 1944, the Wehrmacht had only 304 Panthers on the Eastern Front, while production of the T-34/85 was running at about 1,200 per month. The success of the new design was proved by their use in Operation *Bagration*, in which they made a decisive contribution to the defeat of Army Group Centre.

SPECIFICATIONS

Crew: 5

Combat weight: 31.7 tonnes (35 tons)

Power-to-weight ratio: 14.2hp/ton

Hull length: 6.1m (20ft)

Overall length: 8.1m (26.6ft)

Width: 3m (9.9ft)

Engine: V-2-34 diesel, 4-stroke, 12-cylinder, 500hp at 1,800rpm

Fuel capacity: 545 litres (120 gallons) internal, 270 litres (59 gallons) external

Transmission: dry multi-plate clutch, mechanical gearbox, one stage side drives with side clutches and strap brakes, 4 forward, 1 reverse gears

Max. speed (road): 55km/h (34mph)

Max. speed (cross-country): 30km/h (18.5mph)

Max. range (road): 300km (186 miles)

Fuel consumption: 2.7 litres/km (0.95 gallons/mile)

Fording capability: 1.3m (4.3ft)

Armament: 85mm ZiS-S-53 gun (54.6 calibres long)

Main-gun ammunition: BR-365 armour-piercing; BR-365P sub-cal armour-piercing; OF-365 high-explosive/fragmentation

Muzzle velocity: 1,200m/sec (BR-365P)

Max. effective range: 13.3km (8.3 miles)

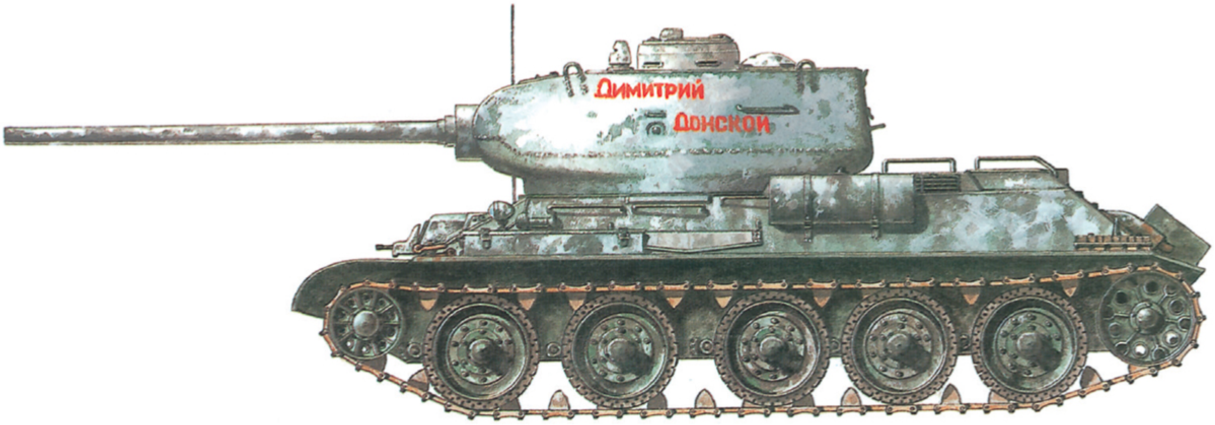
Stowed main gun rounds: 55–60

Gun depression/elevation: -5 / +25 degrees

Secondary armament: hull-mounted and co-axial DTM 7.62mm machine guns

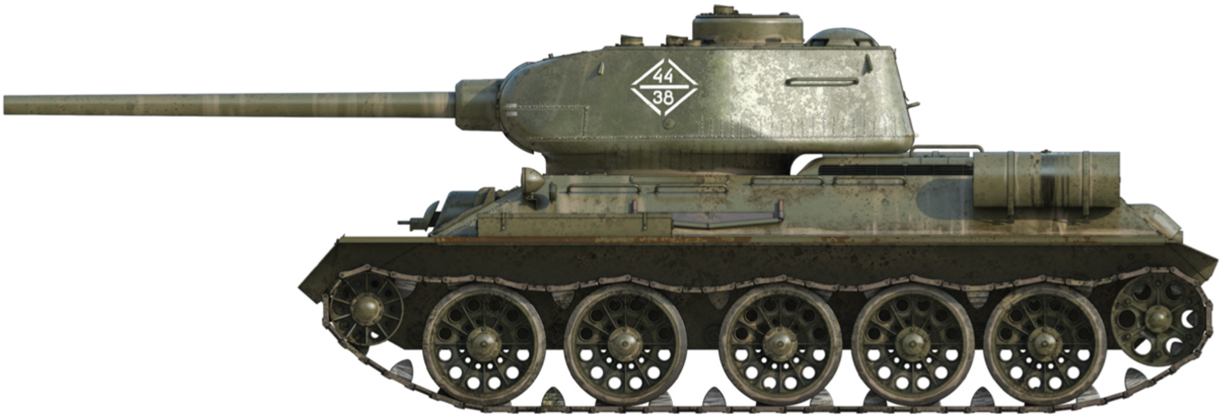
Armour: 90mm (3.54in) turret front; 75mm (2.95in) turret side and rear; 47mm (1.85in) hull glacis and rear; 60mm (2.36in) hull side

TANK DETAILS



T-34/85 MODEL 1943, 38th SEPARATE TANK REGIMENT, 53RD ARMY, UMANSKO-BOTOSHANKSKIY OPERATION, 29 MARCH 1944

This was one of the first T-34/85 units to see combat, and it was initially deployed in the winter of 1944 around the key road junction at Balta (Ukraine), near the Romanian border. The tanks were named ‘Dimitry Donskoi’ after the legendary Muscovite tsar (1359–89) who vanquished the Tartars at Kulikovo in 1380. Funds to purchase the tanks were collected by the Russian Orthodox Church.



T-34/85, 11TH GUARDS TANK CORPS, 1945

The 11th Guards Tank Corps had a simple tactical symbol for its three tank brigades, consisting of small white rectangles on the front of the turret stacked above each other. One rectangle indicated the 40th, two the 44th, and three the 45th Guards Tank Brigade. The brigades also used a fairly common style of movement marking, intended to aid military police in directing traffic: a diamond split in half. The upper half included the tank brigade number, while the lower half had the individual tank number.

THE IS-2

After the fighting around Kursk in mid-1943, the Soviets looked to produce a vehicle that had thicker armour, better to resist the German high-velocity 88mm gun, and a main armament that could penetrate the armour now mounted on the enemy heavy tanks. When the IS-2 ('Iosef Stalin') entered the field in April 1944, its 122mm round imparted considerable force, which helped to make up for the average penetrating ability of its shells. In combat, it proved well suited for its task as a 'heavy' breakthrough tank that could stand up to the German Tiger I and Panther. In one action, on 11 August 1944 in Poland, IS-2 tanks broke up an attack by 11 King Tigers, four German tanks being destroyed (albeit one accounted for by a T-34/76) and three more later abandoned. Seven more King Tigers were destroyed over the next two days.

With a tank's battlefield life generally brief, the IS-2's designers focused on what had made the T-34 so successful: loose tolerances, simplicity and ruggedness. Such attributes facilitated mass production and maintenance and made for a vehicle that could be produced without unduly taxing current manufacturing capabilities. Crew comfort was a secondary concern, and even though the IS-2 had one fewer crewman than the KV-1, the interior was cramped. With only the driver occupying the forward control compartment, the duties of the radio/machine-gun operator were taken over by the commander and driver, respectively.

To keep from degrading the glacis' integrity and anti-ballistic shape, aside from the driver's vision port, the bow machine gun was rigidly fixed into the hull's forward right side. Electrically fired, the weapon provided little more than suppressive fire along the vehicle's axis. With the tank having only two hatches located in the turret, the driver was in a particularly dangerous position should quick extraction be needed. The engine and drivetrain took up the rear compartment, which negated having to run a universal joint along the bottom of the vehicle as on the Tiger II.

SPECIFICATIONS

Crew: 4

Combat weight: 46.08 tonnes (50.8 tons)

Power-to-weight ratio: 11.3hp/ton

Overall length: 9.83m (32.25ft)

Width: 3.07m (10.07ft)

Height: 2.73m (8.96ft)

Ground pressure: 0.81kg/cm^2 (11.5psi)

Ground clearance: 45cm (17.7in)

Armour: 20–120mm (0.79–4.72in)

Max. speed (road): 37km/h (23mph)

Max. speed (off-road): 19km/h (12mph)

Max. range: 150km (93 miles); 230km (143 miles) with external tanks

Trench-crossing capability: 2.5m (8.2ft)

Fording capability: 1.3m (4.27ft)

Vertical step: 1m (3.28ft)

Engine: V-2-IS or V-2 12-cylinder (water-cooled) diesel

Fuel capacity: 790 litres (209 gallons)

Transmission: Synchromesh (clutch synchronizer), 8 forward, 2 reverse

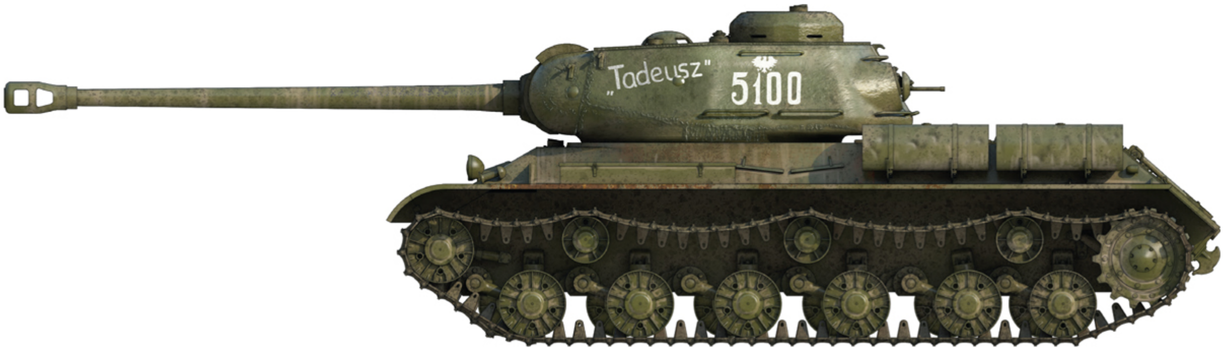
Main armament: 122mm (121.92mm) Model 1943 D-25T L/43

Secondary armament: 3 × 7.62mm DT

Stowed main gun rounds: 28

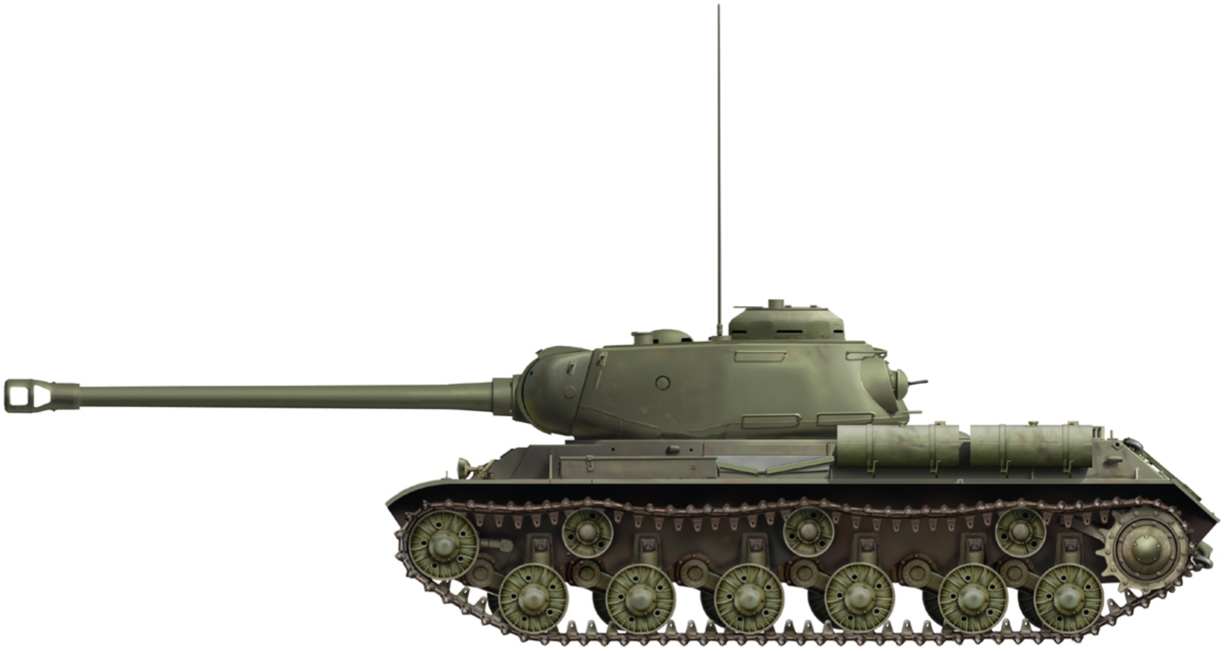
Stowed machine gun rounds: 2,331

TANK DETAILS



IS-2, POLAND, 1945

During the battle of Bautzen (Budiszyn) in Lower Silesia on 19 April 1945, 17 Panther tanks ambushed the Polish 1st Tank Corps near Mückenhain and Kodersdorf, claiming to have destroyed 60 tanks. This was a significant exaggeration, as Polish AFV casualties of all types that day totalled just 44 tanks, of which many were knocked out in other sectors. This IS-2 from the 5th Heavy Tank Regiment was one of the tanks destroyed during the day’s fighting.



IS-2, 70TH GUARDS HEAVY TANK REGIMENT, 1945

Seen in 1945, this vehicle has retained its original green colour, over which splattered mud and dust provides a degree of camouflage. By 1945 Soviet efforts to camouflage armoured vehicles beyond their green ‘83020 4BO’ (basic) security paint jobs steadily declined. For winter, a water-soluble whitewash Type B paint was generally available and applied by the crew or at the Maintenance Company. As camouflage paint patterns were seldom used, foliage could be substituted.

THE MATILDA INFANTRY TANK

The Matilda was the dominant tank in the early days of the war in North Africa. Its heavy armour made it practically invulnerable to Italian anti-tank fire, and it wasn't until the Germans arrived in numbers in the theatre that the Matilda became outclassed and eventually obsolete.

Developed in the pre-war years as a tank specifically designed for supporting infantry, the A11 Matilda was to be heavily armoured; speed was not seen as essential. The A11 was only equipped with a machine gun. With the onset of war it was decided to increase the tank's firepower, and the A12 was equipped with a 2-pdr anti-tank gun and a co-axial machine gun, though only solid shot was provided and no high-explosive. This tank, the Matilda Mark I, was upgraded following the Fall of France, with the Besa machine gun replacing the Vickers on the Mark II and the Mark III featuring an improved engine and transmission system.

The Matilda equipped two army tank battalions during the battle for France in 1940, with 77 A11 and 23 A12 tanks in the 4th and 7th Battalions, Royal Tank Regiment. The British tanks were unsuited to the war of movement imposed upon them by the German blitzkrieg tactics and, although they were largely invulnerable to the German 37mm anti-tank gun, they were often knocked out by German artillery fire. They also suffered heavily from mechanical and track failures. Every single tank committed to the campaign was abandoned in France when the British Expeditionary Force (BEF) was evacuated.

It was in the North African desert that the Matilda found its true role, being christened the 'Queen of the Desert'. In the battles of late 1940 and early 1941 against the Italians, the A12 Matilda outclassed the Italian armour and was immune to their anti-tank fire, providing a key component in the British advance across Libya. With the arrival of German forces, the Matilda's days of dominance were over, but the tank continued to play a vital role through June 1942 and even took part in the first battle of El Alamein in July.

SPECIFICATIONS

Crew: 4

Combat weight: 26.9 tonnes (29.7 tons)

Power-to-weight ratio: 3.6hp/ton

Overall length: 6.02m (19.8ft)

Width: 2.59m (8.5ft)

Height: 2.52m (8.3ft) (high cupola)

Max. speed: 24km/h (15mph)

Max. range: 80km (50 miles) on internal tank

Engine: two Leyland Type E148 and E149 straight 6-cylinder water-cooled diesels, each 95bhp at 2,000rpm

Transmission: Wilson six-speed pre-selector gearbox and Rackham steering clutches

Fuel capacity: 181.8 litres (40 gallons), plus 163.6 litres (36 gallons) in auxiliary tank

Fuel consumption: 2.2 litres/km (0.78 gallons/mile)

Fording capability: 1m (3.2ft)

Armament: ordnance QF 2-pdr (40mm) Mark IX (52-cal), co-axial Besa 7.92mm air-cooled machine gun

Ammunition: AP solid (1kg)

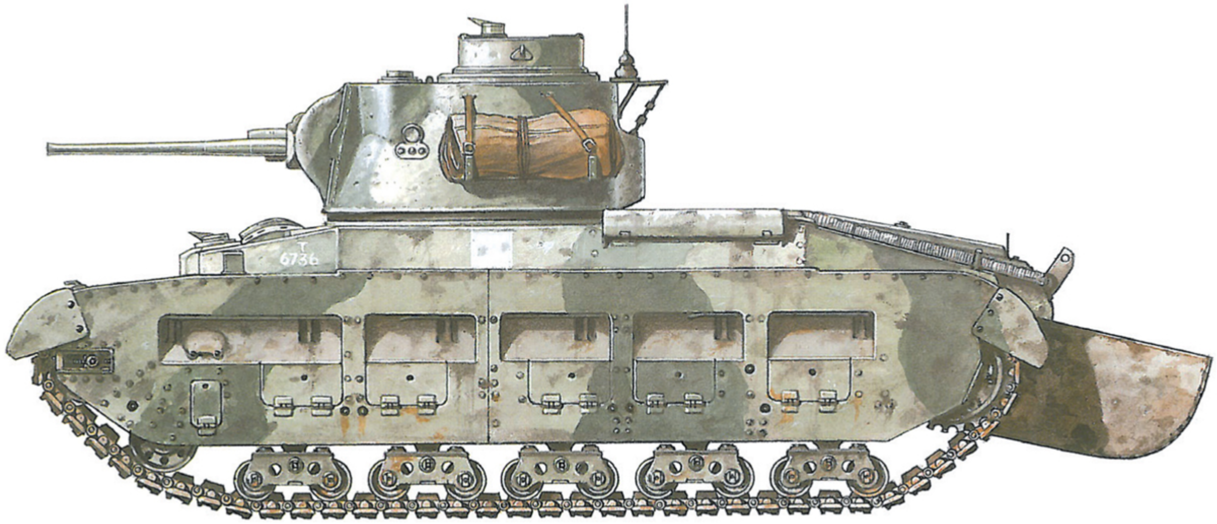
Muzzle velocity: 853 m/sec (2,798ft/sec)

Max. effective range: 1,828.8m (6,000ft)

Ammunition stowage: 93 rounds

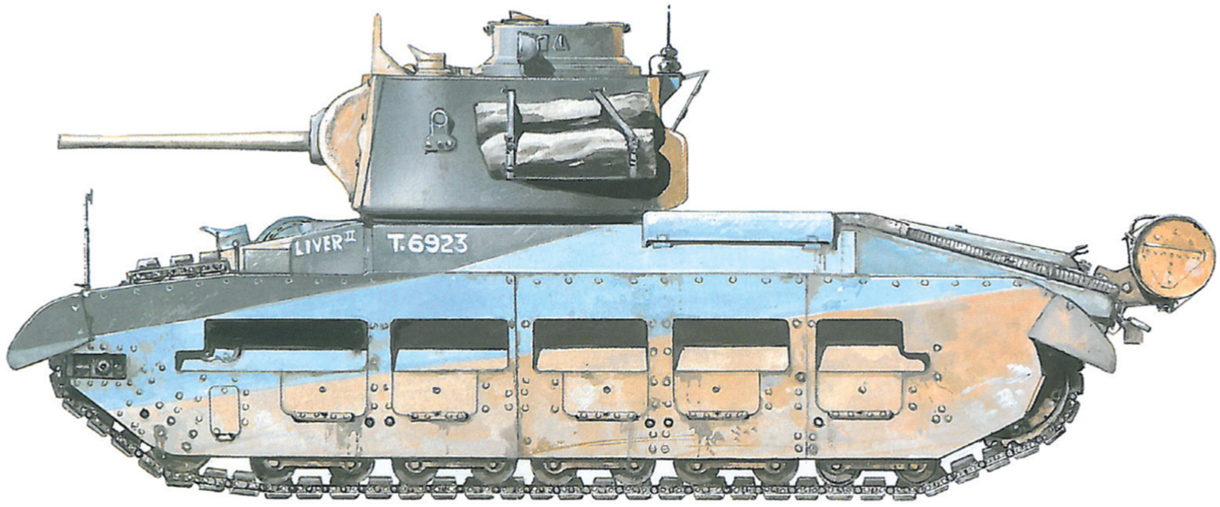
Gun depression/elevation: -20 / +20 degrees

TANK DETAILS



INFANTRY TANK A12, MATILDA MARK I *GAMECOCK*, FRANCE, 1940

This Mark I Matilda of 7th Royal Tank Regiment (RTR), 1st Army Tank Brigade, is shown in the camouflage scheme used by the BEF in France in 1940. The Matilda was ill-suited to the type of war waged during the French campaign, though it did cause the Germans some consternation during the British counter-attack at Arras on 21 May before being halted by German 88mm guns.



INFANTRY TANK MARK II, MATILDA MARK III *GULLIVER II*, 7TH RTR, LIBYA, 1941

Another Matilda of 7th RTR, this time a Mark III in the Western Desert. The unusual colour scheme was designed to break up the outline of the tank and confuse enemy gunners, an idea inspired by World War I experience. The Western Desert proved much more suitable for the Matilda’s attributes, and the tank dominated the battlefield in the early days of the campaign.

THE VALENTINE INFANTRY TANK

More tanks and their derivatives were produced during World War II on the Valentine tank platform than on any other British tank platform. Valentines saw service across North Africa and Italy, through France to Germany, from India to Burma, from New Zealand to Guadalcanal, and from Russia to Berlin. Yet the design started out in 1938 as a stopgap infantry tank, with inferior specifications to the Infantry Tank Mark II (Matilda II), on the promise of quicker, cheaper production and more reliable automotive performance. In the end, from May 1940 to May 1944, 7,260 Valentine tanks (5,840 British, 1,420 Canadian) excluding variants were produced, of which 3,782 were exported to the Soviet Union.

The Valentine was what the British Army classified as an 'infantry tank', a tank used in direct support of pedestrian infantry in the assault, in order to break through fortified defences in particular. It was a three-man, 16-tonne tank initially armed with a QF 2-pdr gun (Mk I–VII), but later upgraded to a QF 6-pdr (Mk VIII–X), a QF 75mm (Mk XI) and the QF 3in howitzer (Mk IIICS). The Valentine's armour standard was 60mm (2.36in) and was never upgraded. In fact, from 1943, the Valentine's hull side armour was reduced from 60mm to 43mm (1.69in) to compensate for the extra weight of the 6-pdr gun and later the 75mm gun. All the powerplants in the Valentines were small six-cylinder in-line engines.

Valentines served in most places in which the British Army fought, making a particularly valuable contribution in North Africa in 1941–42. But in December 1942, Middle East Command's highest authority for the Royal Armoured Corps reported the Valentine as 'definitely obsolete' because of insufficient armour and armament, even with the 6-pdr gun. By 1944, the Churchill had largely replaced the Valentine as a combat tank, but the Valentine was also used as the platform for more variants than any other British tank, including an amphibious DD

(Duplex Drive), bridge-layers, flails, flamethrowers, the 25-pdr self-propelled field gun (Bishop), artillery observation vehicles, and tractors.

SPECIFICATIONS

Crew: 4

Weight: 17.3 tonnes (19 tons)

Power-to-weight ratio: 6.6hp/ton

Overall length: 5.42m (17.78ft)

Overall width: 2.57m (8.43ft)

Overall height: 2.22m (7.28ft)

Ground pressure: 0.8kg/cm^2 (11.36psi)

Ground clearance: 0.41m (1.34ft)

Engine: AEC A190 diesel, 131hp at 1,800rpm

Transmission: Meadows Number 22 (clash), 5 forward, 1 reverse

Fuel capacity: 164 litres (43 gallons) + 136 litres (36 gallons) auxiliary

Max. speed (road): 24km/h (15mph)

Max. speed (off-road): 15km/h

Max. range: 177km (110 miles)

Trench-crossing capability: 2.29m (7.51ft)

Fording capability: 0.91m (2.98ft)

Vertical step: 0.84m (2.76ft)

Armour: 60mm (2.36in) hull nose, sides, and rear; 60mm (2.36in) glacis; 60–65mm (2.36–2.56in) turret

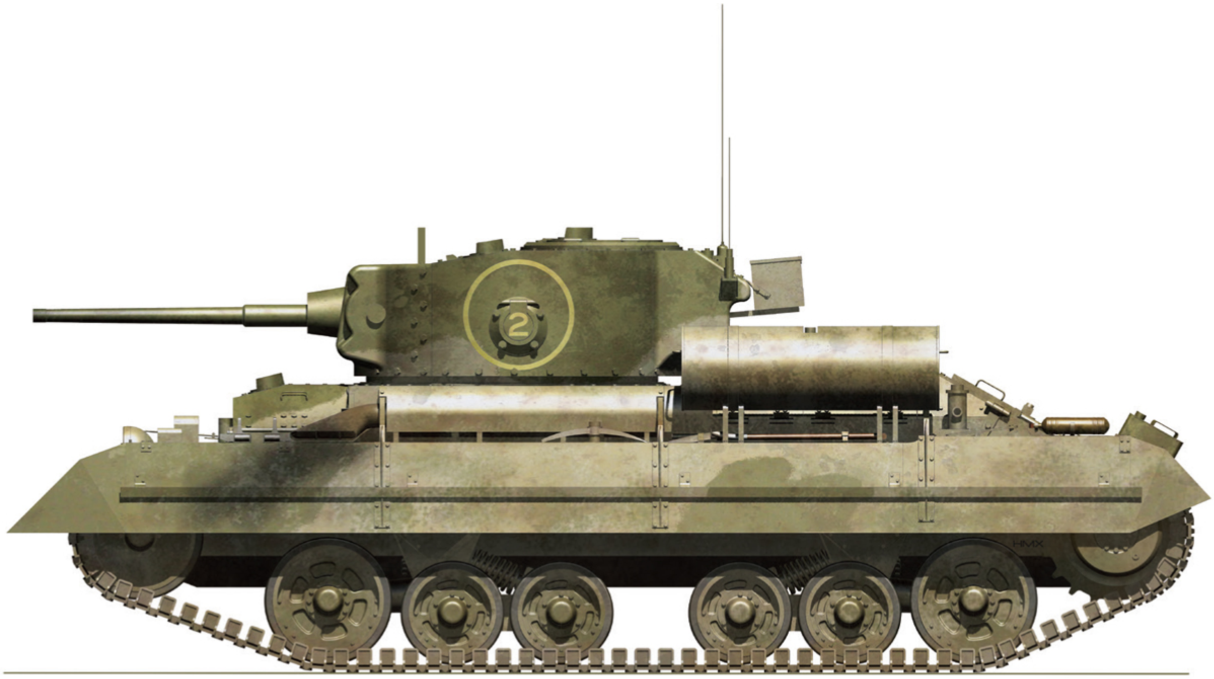
Main armament: 40mm QF 2-pdr Mk IX or X L/52

Secondary armament: 7.92mm Besa MG (co-axial) and 7.7mm 0.303in Bren MG (AA)

Stowed main gun rounds: 60

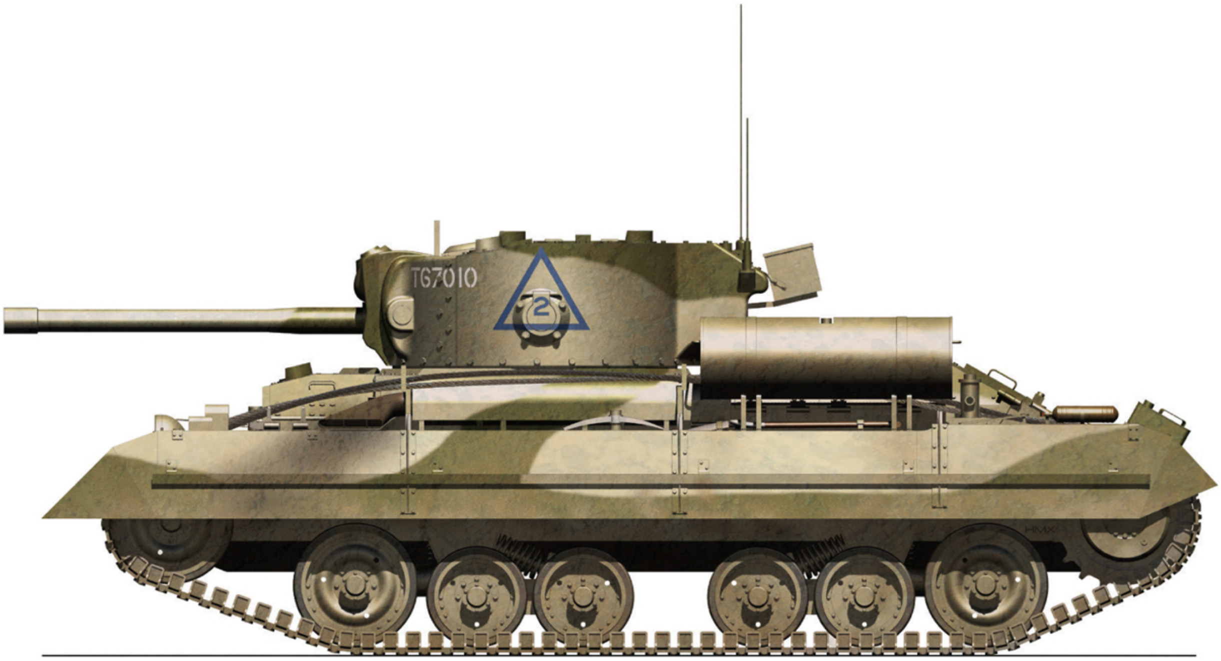
Stowed machine gun rounds: 3,150 × 7.92mm rounds; 600 × 7.7mm rounds

TANK DETAILS



VALENTINE III, TUNISIA, DECEMBER 1942

The Allied landings in Morocco and Algeria started on 8 November 1942. In Britain, this tank was configured for ‘Desert Service’ with sand-coloured paint. For the greener conditions of Tunisia, patches of khaki have been painted. The unit has painted a number ‘2’ on the left revolver port to denote the 2nd Troop, and a circle to denote ‘C’ Squadron, all in yellow to denote the middle regiment of the brigade in terms of seniority.



VALENTINE IX, TUNISIA, MARCH 1943

Around June 1942, the British Ministry of Supply authorized a Valentine with a 6-pdr in a turret. The Department of Tank Design accommodated the 6-pdr gun, but only two crewmen and no co-axial machine gun. The prospect of this turret and the Valentine II/III hull was known as Valentine VIII, but the Valentine V hull was substituted in order to standardize the GMC engine, except that the side armour was reduced further. This combination was the Valentine IX, which was delivered from late 1942 to mid-1943.

THE CHURCHILL INFANTRY TANK

The Churchill is one of the most well-known examples of the British 'infantry tank' concept. The basic requirement of this design was armour heavy enough to withstand the fire of any anti-tank gun known to be in service during the design phase, and firepower consistent with its task; speed was not considered to be an essential quality, since the pace of any engagement would be geared to that of the infantry. The Churchill was envisioned to fight on a battlefield similar to that of the Western Front in 1918 and was given a wide trench-crossing capacity and the ability to drive over the worst shell-torn ground. The design incorporated a high top run for the tracks, so the vehicle's hull contained a hint of its World War I ancestors.

On the virtues and vices of the Churchill its crews were unanimous. They welcomed the stout armour and the sponson escape hatches, the tank's ability to climb the steepest hills and wallow through the deepest mud, and the additional stowage space permitted by the wide hull, but they regretted the absence of a main armament that would put them on equal terms with German tank crews.

The Churchill came into its own in the close country of the Normandy bocage, with its banked hedgerows and patchwork of small fields, where it played a vital role in supporting the infantry. The tank's multiple-bogey suspension enabled it to cross terrain that no other tank could. Churchills played a particularly decisive role in the capture of Hill 309 on 30 July 1944. In the course of a single day the Churchills of the 6th Guards Tank Brigade covered 10km (6 miles) across country over close bocage, a feat many felt could only have been performed by Churchills.

The Churchill was produced in an astonishing spectrum of variants during the war years, further cementing its importance. These variants included a flamethrower tank, an Assault Vehicle Royal Engineers

(AVRE) carrying everything from demolition mortars to portable bridges, an armoured recovery vehicle and a mine-clearing flail tank.

SPECIFICATIONS

Crew: 5

Combat weight: 35.3 tonnes (39 tons)

Power-to-weight ratio: 8.9hp/ton

Hull length: 7.44m (24.4ft)

Overall length: 7.44m (24.4ft)

Height: 2.44m (8ft)

Width: 3.25m (10.7ft)

Engine: Bedford Twin-Six 350hp

Transmission: Merrit-Brown four-speed gearbox

Steering: controlled differential

Max. speed (road): 25km/h (15.5mph)

Max. speed (cross-country): 13km/h (8mph)

Fording capability: 1m (3.3ft) (without preparation)

Vertical obstacle: 76cm (2.5ft)

Armament: 6-pdr gun (Ordnance QF Mk III)

Main-gun ammunition: 6-pdr APC (Armour-Piercing with Cap), 6-pdr APCBC (Armour-Piercing with Cap, Ballistic Cap), 6-pdr APDS

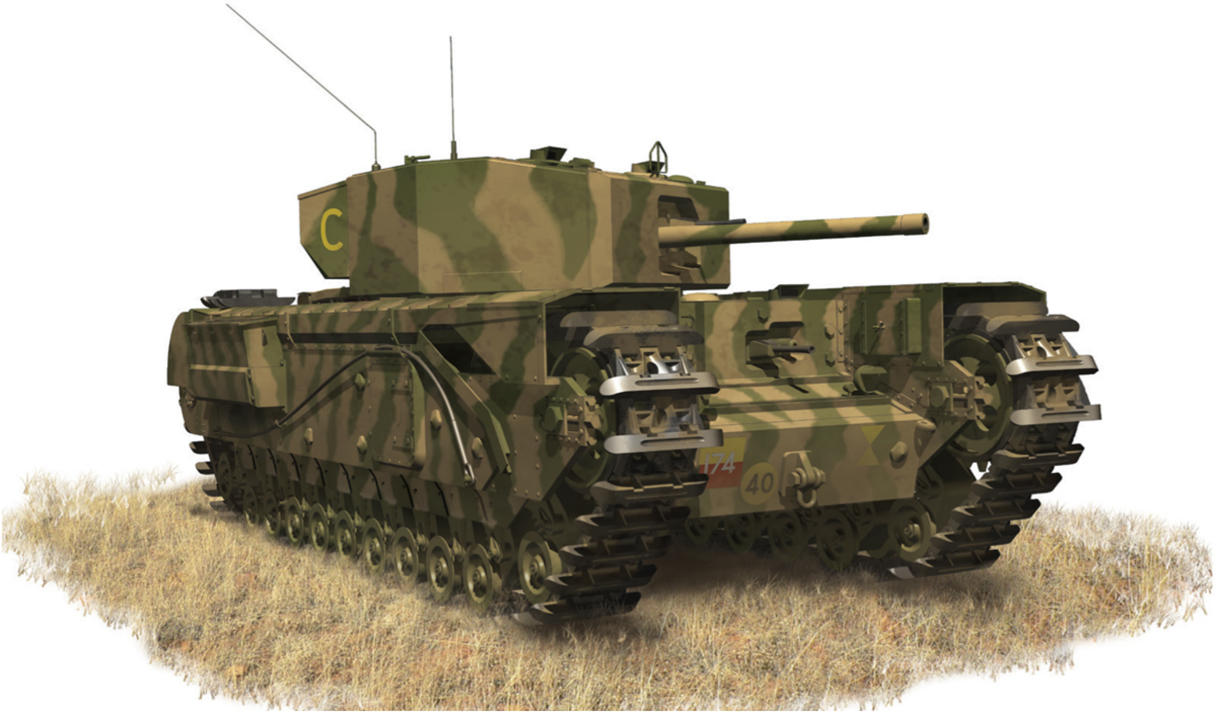
Muzzle velocity: 903 m/sec (2,965ft/sec)

Armour penetration: 81mm (3.2in) at 460m (0.29 miles) with target at 30 degrees

Stowed main gun rounds: 84

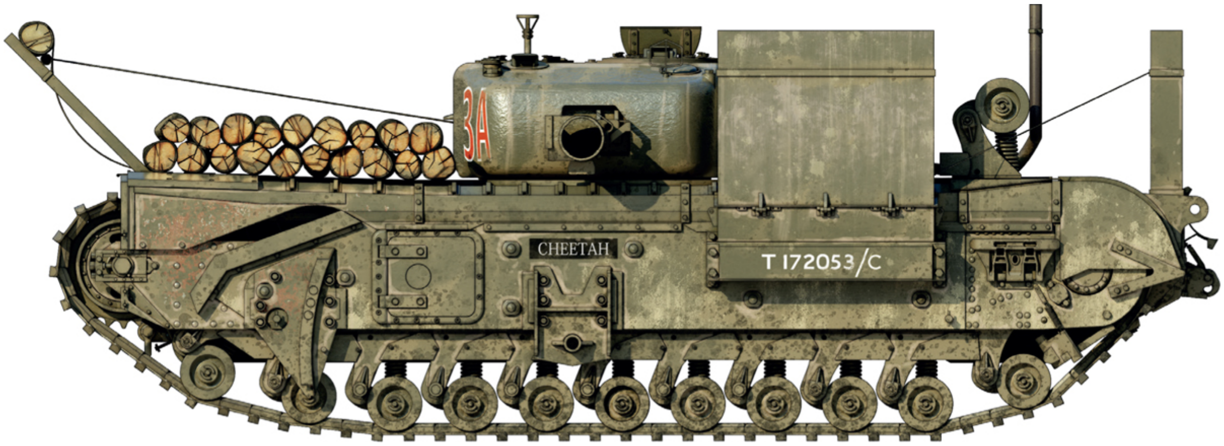
Gun depression/elevation: -12.5 / +20 degrees

TANK DETAILS



CHURCHILL MARK III, TUNISIA, 1942

The Churchill Mark III had an all-welded turret and was armed with a 6-pdr gun. This one served with 145th Regiment Royal Armoured Corps, which at one time was 8th Battalion, The Duke of Wellington's Regiment, the 3rd Regiment in 21st Armoured Brigade. The tanks arrived in Tunisia painted an overall green colour; however, this regiment camouflaged their tanks with a disruptive pattern of cream or sand-coloured paint.



CHURCHILL AVRE, NORMANDY, JUNE 1944

When carrying the Log Carpet (used for crossing soft terrain), the Churchill AVRE had its turret traversed to the eight o’clock to nine o’clock position. The crew could then release the first log by releasing the cordage that held it in place. At this point, the tank would begin driving over the first log, with the succeeding Log Carpet dragged under the tracks.

THE CRUSADER CRUISER TANK

The Crusader tank came into British service in 1941, seeing combat action in the North African desert. Ultimately, it was born out of a flawed design concept inherited from the pre-war British Army that separated tank designs into 'infantry' and 'cruiser' types, but it fulfilled a role until other, better designs could be introduced.

The Crusader's official designation was the 'Tank, Cruiser, Mark VI', and it was developed from an earlier cruiser tank, the A13, by Nuffield Mechanization and Aero in Birmingham, which provided the basic design for both the Covenanter (the Mark V) and the Crusader. The tank was sent straight to production and was ready for issue by May 1941, being sent to the Western Desert immediately.

The Crusader mounted a 2-pdr main gun, with a co-axial Besa machine gun. The Mark VI also had another Besa in an auxiliary turret to the front left of the tank. The armour plate was initially only 30mm thick, though this was increased on later variants, while the tank was powered by a Nuffield Liberty Mark III V-12 engine that was plagued with mechanical issues in operational use.

Issued to 6th Royal Tank Regiment in May 1941, the Crusader was sent straight into action in North Africa, taking part in Operation *Battleaxe* in June, the failed attempt to relieve Tobruk. The more successful Operation *Crusader* of June 1941 featured an entire armoured brigade, the 22nd, equipped with the tank. Combat use revealed that the Crusader was both under-armoured and under-gunned in comparison to its German adversaries, though its speed was impressive. It also suffered from major reliability problems. Although attempts were made to increase the armour protection and lethality of the tank, including fitting a 6-pdr gun to the turret, by the end of the campaign in North Africa the Crusader had been declared obsolete and all of the British regiments equipped with it were re-equipped with

Shermans. The chassis continued to be used for other purposes, including anti-aircraft and self-propelled guns.

SPECIFICATIONS

Crew: 3

Combat weight: 19.8 tonnes (21.8 tons)

Power-to-weight ratio: 17.8hp/ton

Overall length: 5.98m (19.6ft)

Width: 3.52m (11.5ft)

Height: 2.24m (7.3ft)

Engine: Nuffield Liberty Mark III/IV V12, water-cooled, 340bhp at 1,500rpm

Transmission: Nuffield constant mesh four-speed gearbox and Wilson dual regenerative epicyclic steering, air operated

Fuel capacity: 500 litres (200 gallons), plus 136 litres (30 gallons) in auxiliary tank

Max. speed: 43km/h (26.7mph)

Max. range: 177km (110 miles) on main tank

Fording capability: 0.96m (3.1ft)

Fuel consumption: 2.8 litres/km (0.99 gallons/mile)

Armament: 6-pdr, 7cwt QF Mark III (57mm); co-axial 7.92mm Besa air-cooled machine gun

Ammunition: AP, APC, APCBC, HE

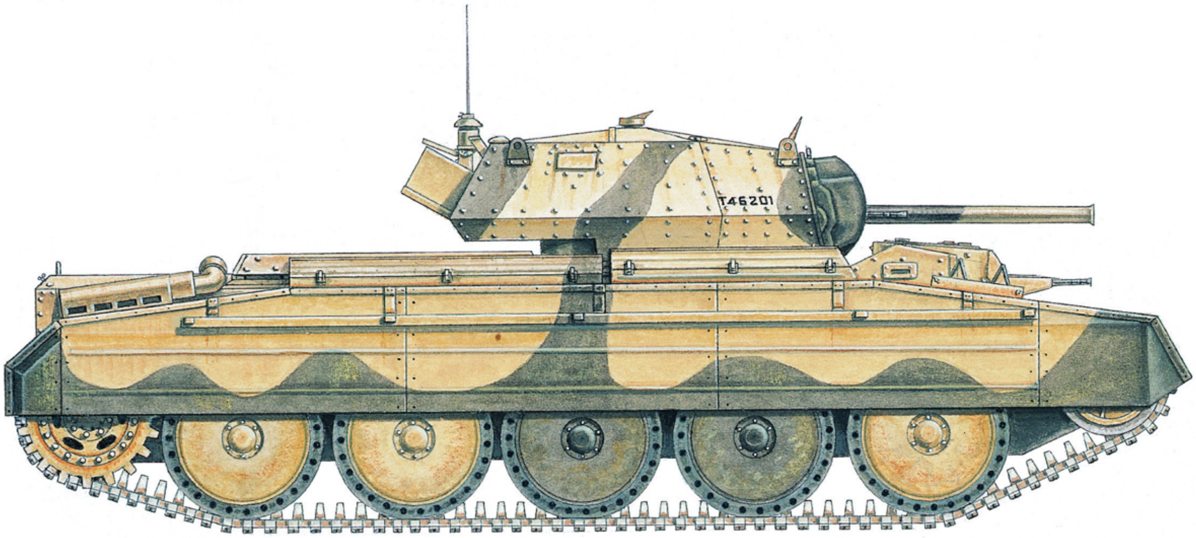
Muzzle velocity: 853m/sec (2,799ft/sec)

Max. effective range: 1.83km (6,000ft)

Ammunition stowage: 65 rounds

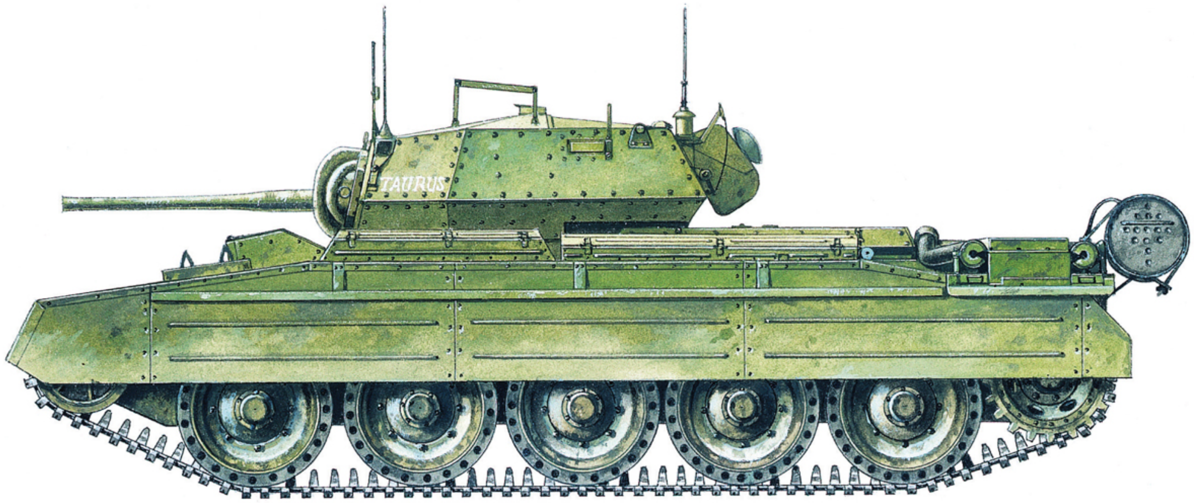
Gun depression/elevation: -12.5 / +20 degrees

TANK DETAILS



CRUSADER MARK I, 3RD RTR, 8TH ARMOURED BRIGADE, 10TH ARMOURED DIVISION

This Crusader Mark I is equipped with the auxiliary machine-gun turret that proved difficult to use and was removed on later variants. 3rd Royal Tank Regiment (RTR) fought with the Crusader during the Alamein battles of 1942 before taking part in the Tunisian campaign.



CRUSADER MARK II COMMAND TANK *TAURUS*

This plate shows a command tank of the 11th Armoured Division in Britain. Command tanks can be identified through the proliferation of aerials needed for the quantity of radio equipment carried. The main gun was removed and replaced by a convincing dummy.

THE M3 GRANT MEDIUM TANK

After heavy tank losses in France, the British Army wanted to purchase 3,650 cruiser tanks in the United States, preferably based on British designs. Neither the US government nor industry was interested in manufacturing British designs, and British tank officers were not keen on the M3 after being shown early mockups. But with little bargaining power, the British purchasing team reached an agreement under which a variant of the M3 medium tank with a different turret (the British turret was more spacious and had a simple hatch instead of a cupola) and other modifications would be built for the British Army.

The British variant of the M3 medium tank, called the 'General Grant I' in Britain, was manufactured by Baldwin, Pressed Steel Car Company, and Pullman Standard Car Company. Besides the different turret, there were other small differences, such as a periscope for the driver. Improvements were gradually made to the Grant during production, including the addition of full sand-skirts over the suspension and the new WE-210 rubber-block track. Production of the custom-built Grant I tank could not meet the British need for tanks caused by high casualty rates in the North African campaign, so Britain also acquired the American version of the M3 medium tank, which was known locally as the 'General Lee I'.

The Grant was a godsend to British armoured divisions in the spring and summer of 1942 because of its good armour and heavy firepower, which current British tank designs sorely lacked. Its powerful 75mm gun could penetrate contemporary Panzer armour, and it was also capable of dealing with the deadly 88mm anti-tank guns. The Grant entered combat at the turning point of the war against Germany in North Africa. It was used by the British Eighth Army in the 1942 battles at Gazala, Alam Halfa and El Alamein, and later took part with both British and US tank units in the final defeat of the Afrika Korps in Tunisia in 1943.

SPECIFICATIONS

Combat weight: 27.8 tonnes (30.7 tons)

Power-to-weight ratio: 13hp/ton

Overall length: 5.6m (18.4ft)

Width: 2.7m (8.9ft)

Height: 3.10m (10.2ft)

Engine: Continental R975 EC2 radial 400hp 9-cylinder petrol engine with 973in^3 displacement

Transmission: synchromesh transmissions with 5 forward and 1 reverse gears

Fuel capacity: 795 litres (175 gallons)

Max. speed (road): 38.6km/h (24mph)

Max. speed (cross-country): 24km/h (15mph)

Max. range: 193km (120 miles)

Fuel consumption: 3.9 litres/km (1.4 gallons/mile)

Ground clearance: 43cm (17in)

Armament: 75mm M2 gun in M1 mount in hull; 37mm M6 gun in M24 combination mount in turret with co-axial .30-cal machine gun; two .30-cal Browning machine guns in hull

Muzzle velocity: 75mm gun: 588m/sec (1,930ft/sec) with APC; 37mm gun: 884m/sec (2,900ft/sec) with M51 APC

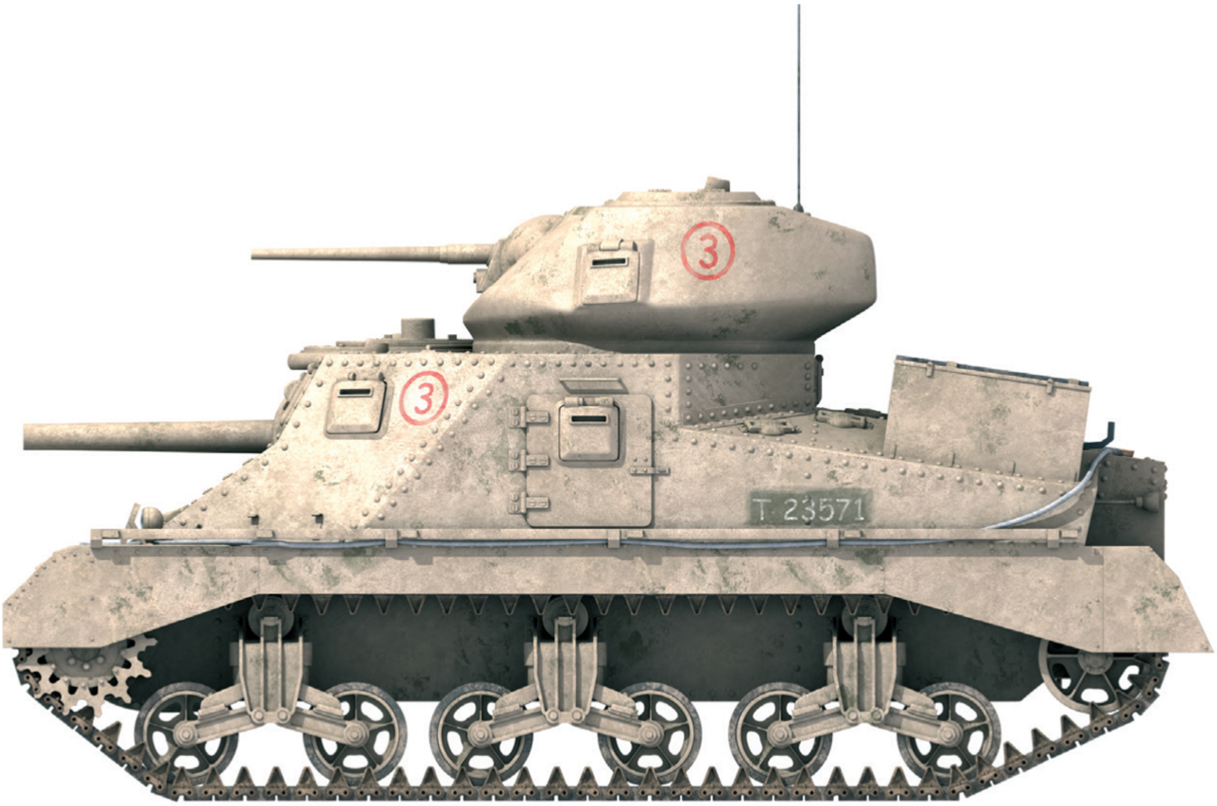
Penetration: 75mm M61 APC = 60mm (2.36in) at 457m (500yds) at 30 degrees; 37mm M51 APC = 53mm (2in) at 457m (500yds) at 30 degrees

Max. effective range: 75mm: 12,435m (13,600yds); 37mm: 11,750m (12,850yds)

Gun depression/elevation: 75mm: -9 / +20 degrees; 37mm: -7 / +60 degrees

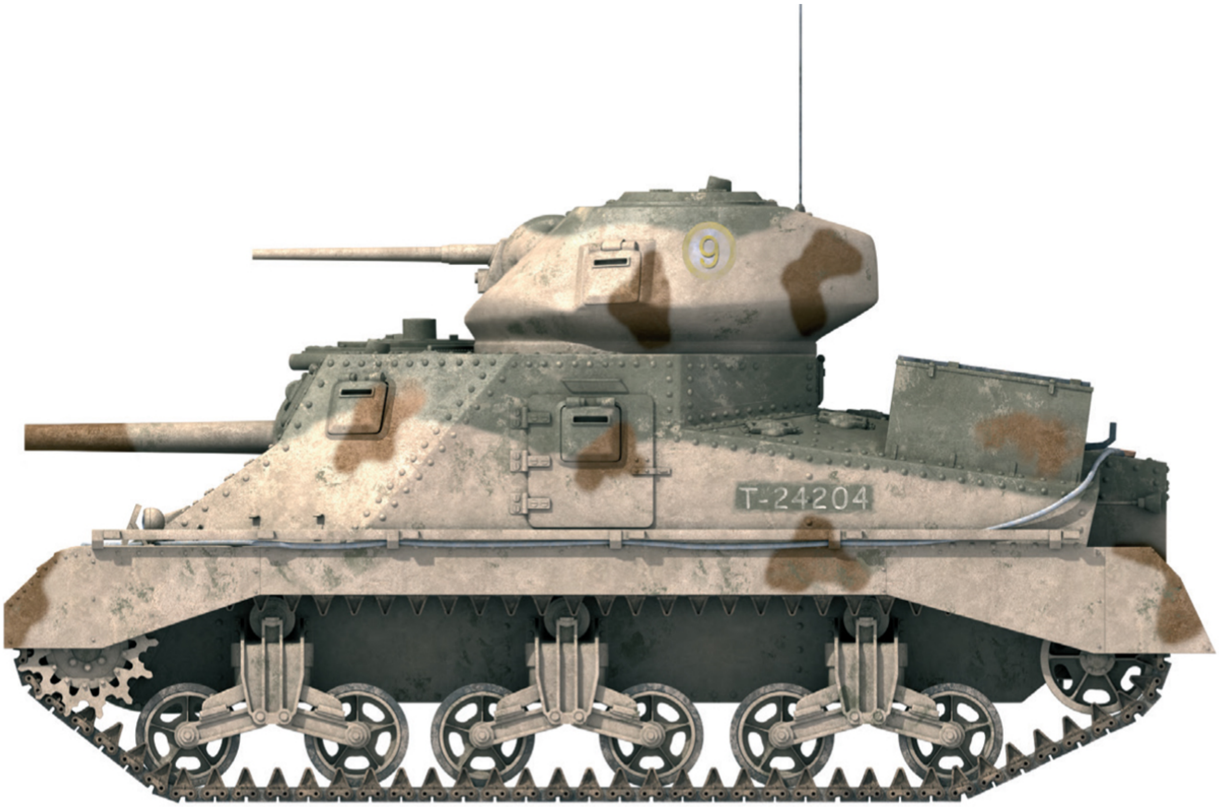
Armour: 51mm (2in) turret mantlet and turret sides; 51mm (2in) hull front; 38mm (1.5in) hull sides

TANK DETAILS



GRANT CRUISER TANK, 22ND ARMOURED BRIGADE, GAZALA, MAY 1943

The M3's most distinctive feature is its tall silhouette. The hull-mounted 75mm gun had a limited traverse compared with the much less effective 37mm turret above it, but it did give British armour the firepower it needed to counter Rommel's superb Panzer forces. This tank is the British-modified Grant version of the M3.



GRANT CRUISER TANK, EGYPT, 1943

Unit commanders were given some discretion in the application of camouflage patterns in early 1942, and the 3rd Royal Tank Regiment adopted a pattern of light stone over the lower portion of the tank, leaving the upper surfaces in the original olive drab. To break up the light stone, blotches of purple-brown were sprayed on. The turret tactical numbers are in yellow in the usual fashion. Many tanks in the unit had cartoon characters painted on the hull side, although this tank does not appear to.

THE SHERMAN FIREFLY

During 1942 the British Eighth Army in North Africa began to receive large numbers of American M4 Sherman tanks. However, the Allies were well aware that the Sherman could not match up to the powerful German tanks that were beginning to enter production, such as the Panther. With its high-velocity L/70 calibre 75mm armament, the Panther was capable of destroying a Sherman tank at twice the previous combat range in any one-on-one encounter. As such, three or four Shermans were often lost in order to destroy just one Panther or Tiger. By 1943, the British had developed the highly effective 17-pdr anti-tank gun, which had a performance comparable to the 75mm gun of the Panther. At the time, there was no British tank design capable of mounting such a heavy weapon due to the limited size of their turrets. As an interim measure, hundreds of Shermans were fitted with the 17-pdr by mounting the weapon on its side and extending the turret at the rear. This model was known as the Sherman Firefly and eventually represented almost one in every four tanks in British units. The Firefly was still very similar externally to the standard Sherman, with the glaring exception of the much longer barrel of the 17-pdr, which overhung the front of the vehicle; this made the Firefly stand out among standard Shermans. The Germans soon learnt to knock out any Fireflies they encountered before tackling the standard Shermans – an unwelcome surprise for many British tank crews who received the new tank at short notice and with little training.

Nonetheless, the Firefly still had formidable killing power, particularly when armed with APDS ammunition, which had the potential to penetrate even the thick, sloped frontal armour of the massive Tiger II at ranges of up to 1,372 metres (1,500yds). In one of the most impressive tank duels of the war, a Sherman Firefly managed to dispatch three Tigers with just five rounds thanks to the accurate fire of Trooper Joe Ekins of the 1st Northamptonshire Yeomanry.

SPECIFICATIONS

Crew: 4

Combat weight: 31.5 tonnes (34.75 tons)

Overall length: 7.8m (25.6ft)

Width: 2.6m (8.5ft)

Height: 2.7m (8.9ft)

Engine: Chrysler A57 multi-bank

Transmission: five-speed synchromesh and controlled differential steering

Fuel capacity: 727 litres (160 gallons)

Armament: 17-pdr Mark IV QF gun and .30cal Browning machine gun

Ammunition stowage: 77 rounds

Muzzle velocity: 883m/sec (2,900ft/sec)

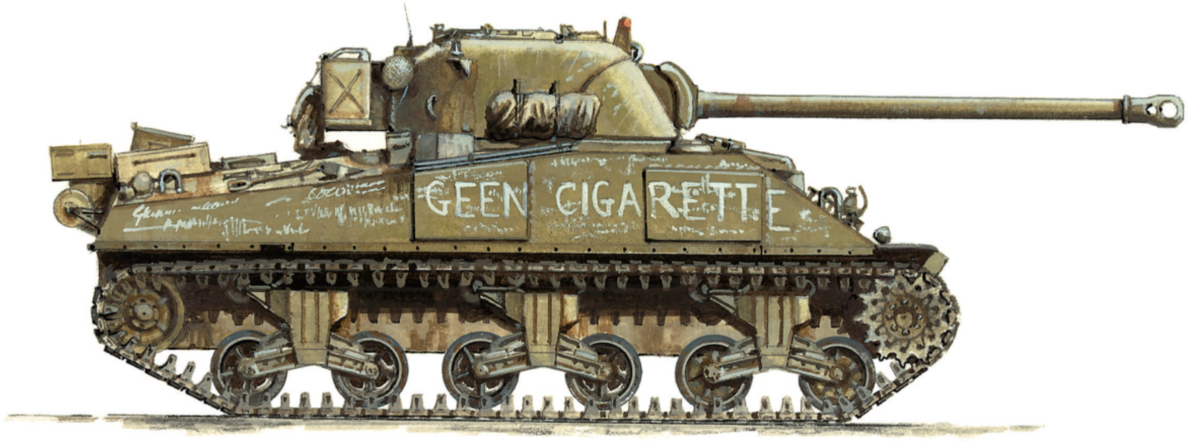
Max. effective range: 2.3km (1.4 miles)

Gun depression/elevation: -5 / +20 degrees

Speed: 36km/h (22.25mph)

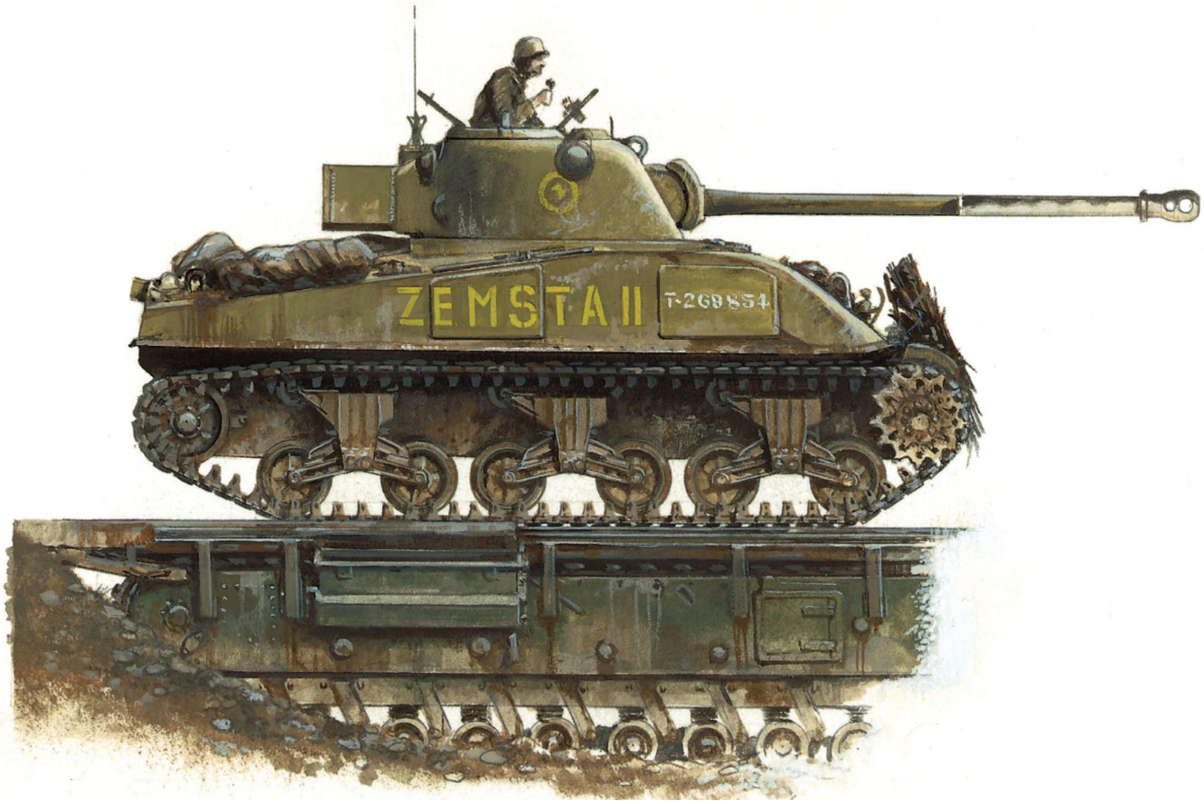
Max. armour thickness: 7.62cm (3in)

TANK DETAILS



SHERMAN VC FIREFLY, 2ND BATTALION IRISH GUARDS, GUARDS ARMOURED DIVISION, NETHERLANDS, 1944

An entirely standard Firefly with some interesting details. Brackets holding jerry cans have been fitted to each side of the turret radio box, and patches of appliqué armour have been welded to the side of the hull. They added 1in to the tank's armour.



SHERMAN IC HYBRID FIREFLY 'ZEMSTA II' ('REVENGE') OF C SQUADRON, 1ST KRECHOWIECKI LANCERS, 2ND POLISH ARMOURED BRIGADE, ITALY, 1944

A Polish Firefly with patches of appliqué armour covering the regular areas but not the turret and with the gun barrel camouflage paint effect. It is shown crossing a Churchill ARK – a redundant Churchill tank hull that was used to provide a causeway for other tanks to cross in difficult terrain. The Firefly also carries a fascine for use in a muddy ditch.

THE CROMWELL HEAVY CRUISER TANK

The Cromwell tank replaced the Crusader as the principal cruiser tank in the British armoury and proved to be a much more successful design. It saw extensive service in the last years of World War II, mainly with the cavalry reconnaissance regiments.

As early as the battle for France it was clear that British tanks were under-gunned and armoured in comparison to their German adversaries, but the necessity of keeping an armoured force following the BEF's evacuation from France ensured the continuation of obsolete tank programmes. Although interim designs dominated the ranks of British armour in the mid-war years, by 1943 better tanks such as the Cromwell were coming into mass production. Initially mounting the 6-pdr gun, which was later rebored to take American 75mm ammunition in order that a high-explosive shell could be used, the Cromwell was powered by the excellent Rolls-Royce Meteor engine that gave it an impressive top speed of over 60km/h (37mph).

The Cromwell saw service for the first time in Normandy, where it equipped the entire 7th Armoured Division as well as the cavalry reconnaissance regiments. A rival variant – known as the Centaur – was also used on D-Day itself as a close-support weapon for the Royal Marines. A lengthened Cromwell chassis mounting the 17-pdr gun, known as the Challenger, was also developed to provide heavy anti-tank support. The reliability and speed of the Cromwell was impressive, with the 7th Armoured Division advancing some 110km (68 miles) in one day following the Normandy breakout. However, the gun was still underpowered when compared with the German Tiger and Panther tanks, and efforts were made to upgrade the design with a shortened version of the 17-pdr gun, resulting in the Comet tank, which came into service in November 1944. The Cromwell series was the second most common British cruiser tank, though limitations on engine production meant that in Normandy in June 1944 for every Cromwell there were about three Shermans.

SPECIFICATIONS

Crew: 5

Combat weight: 27.4 tonnes (30.3 tons)

Overall length: 6.4m (21ft)

Width: 3.05m (10ft)

Height: 2.48m (8.1ft)

Engine: Rolls-Royce Meteor V-12 liquid-cooled petrol, 600hp

Power-to-weight ratio: 21.4hp/ton

Ground pressure: 1.04kg/cm^2 (14.9psi)

Transmission: 5 forward, 1 reverse

Ground clearance: 0.41m (1.34ft)

Max. speed (road): 52km/h (32mph)

Max. speed (cross-country): 29km/h (18mph)

Fuel capacity: 527 litres (139 US gallons)

Max. range: 278km (173 miles)

Fording capability: 1.22m (4ft)

Vertical step: 0.91m (2.98ft)

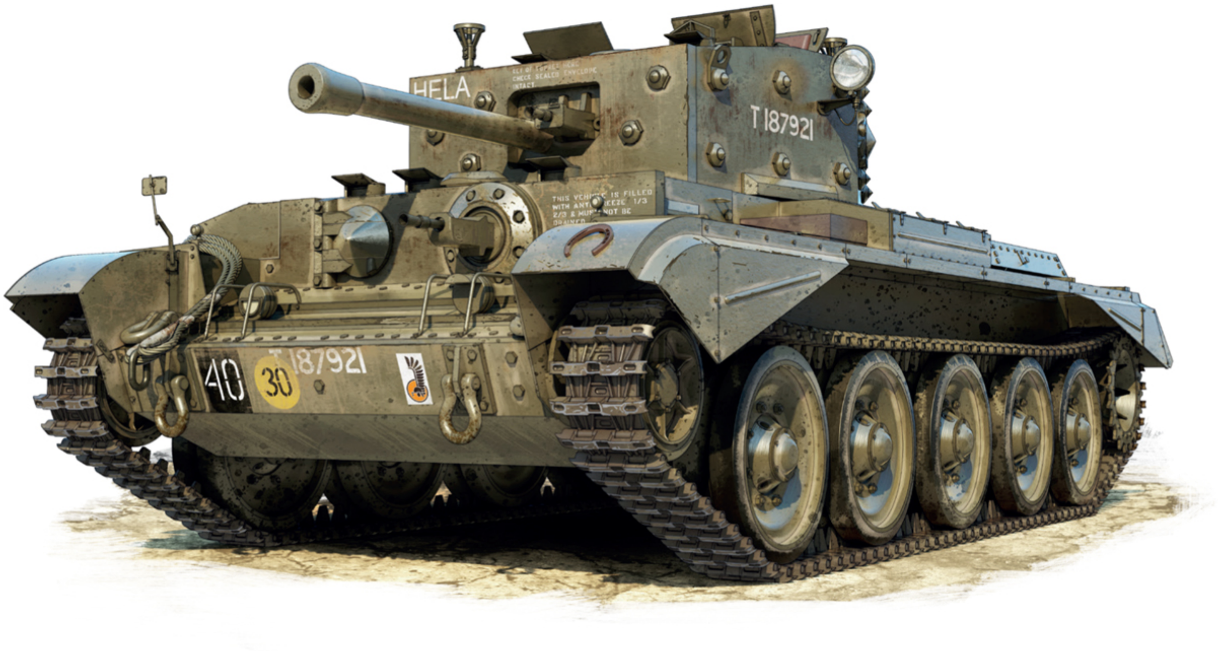
Armament: 75mm Mark V or VA gun; two 7.92mm Besa air-cooled machine guns

Stowed main gun rounds: 64

Stowed MG rounds: 4,950

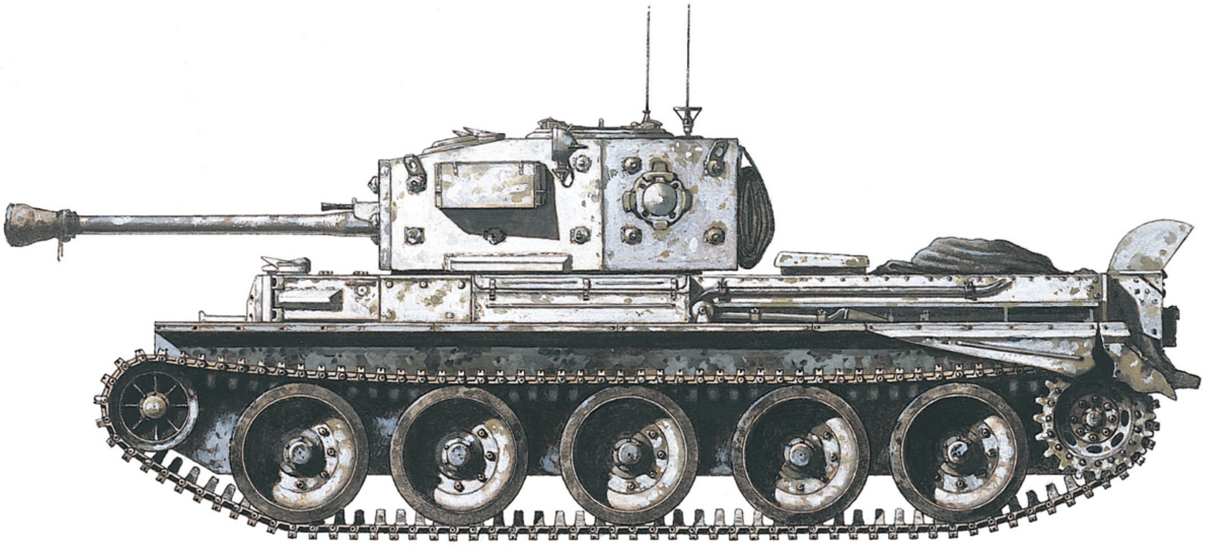
Armour: 57mm (2.24in) front hull; 32mm (1.23in) hull sides and rear; 76mm (3in) turret front; 63mm (2.49in) turret sides

TANK DETAILS



CROMWELL MARK IV, 1ST POLISH ARMOURED DIVISION, 1944

This Cromwell, named ‘Hela’, served in the divisional headquarters of the 1st Polish Armoured Division and was often used by the divisional commander, General Stanisław Maczek. It carries the usual British-pattern insignia including the Army of Service (AoS) sign (white 40 on black square), the yellow/black bridge weight symbol, and the divisional insignia based on the Polish 17th-century winged hussars.



CROMWELL, MARK IV, KING'S OWN HUSSARS, 7TH ARMOURED DIVISION, OPERATION *BLACKCOCK*, JANUARY 1945

Operation *Blackcock* involved some bitter fighting in harsh winter conditions along the Dutch/German border. Tanks were given a rough coating of whitewash to reduce contrast with the snowy landscape, and this obliterated all the usual markings. Although the 8th Hussars were nominally the reconnaissance regiment, by this stage of the war they had become the de facto fourth armoured regiment of the 22nd Armoured Brigade.

THE CHURCHILL CROCODILE FLAMETHROWER

The British had experimented with flamethrower weapons during World War I, and they saw extensive use in 1940 during the preparations for a potential German invasion under the aegis of the Petroleum Warfare Department. It was perhaps inevitable that these weapons should be mounted on vehicles, and then tanks. In 1941 Ronson flame projectors were mounted on universal carriers, while in 1942 two of these flame projectors were mounted on the new Churchill tank, which became known as the Churchill Oke after one of the officers involved in the conversion. Three of these Churchills accompanied the Canadian forces on the ill-fated Dieppe raid of August 1942. The flamethrower concept was revised, with a trailer being used to carry the flame fuel so that the normal fighting capabilities of the tank were not impaired. This resulted in the development of the Churchill Crocodile.

Based on the Churchill Mark VII, this mounted the Wasp II flame projector, which replaced the hull machine gun. The system was powered by high-pressure nitrogen carried in an armoured fuel trailer, which could be jettisoned if hit. The flame weapon was a devastating device. Feeding from 1,800 litres (475 gallons) of fuel and nitrogen propellant, it could deliver 80 one-second bursts of directed flame, out to distances of 110m (120yds). Another option was to spray unlit fuel over the target area, then ignite it with a subsequent burst of flame.

The new flamethrower tank equipped three regiments of the 31st Armoured Brigade, part of the 79th Armoured Division that contained so much of the specialized armour used in the campaign in Northwest Europe. The first Crocodiles went ashore on D-Day with the 141st Regiment Royal Armoured Corps, and later supported US units during their assault on the fortifications at Brest. Crocodiles were also used in

Italy with the 25th Armoured Engineer Brigade, where, in conjunction with Canadian Wasp flamethrower carriers, they supported the crossing of the river Senio on 9 April 1945 so successfully that the attacking 2nd New Zealand Division suffered no casualties at all.

SPECIFICATIONS

Crew: 5

Combat weight: 41.7 tonnes (46 tons)

Overall length: 12.3m (40.4ft)

Height: 2.4m (7.9ft)

Width: 3.2m (10.5ft)

Engine: Bedford Twin-Six 350bhp

Transmission: Merrit-Brown H41

Fuel capacity: 682 litres (150 gallons)

Max. speed: 21km/h (13mph)

Max. range: 144km (89 miles)

Fording capability: 1m (3.2ft) (without preparation)

Armament: 75mm Mark V and 7.92mm Besa machine gun

Ammunition: 84 rounds

Muzzle velocity: 618m/sec (2,028ft/sec)

Effective range: 1.8km (1.1 miles)

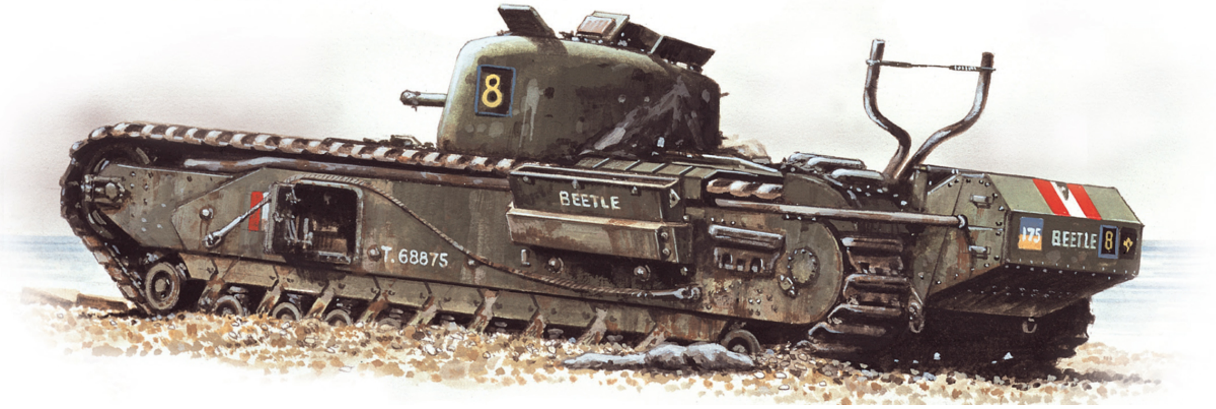
Gun depression/elevation: -12.5 / +20 degrees

Flame fuel capacity: 1,818 litres (400 gallons)

Flame fuel consumption: 21 litres/sec (4.6 gallons/sec)

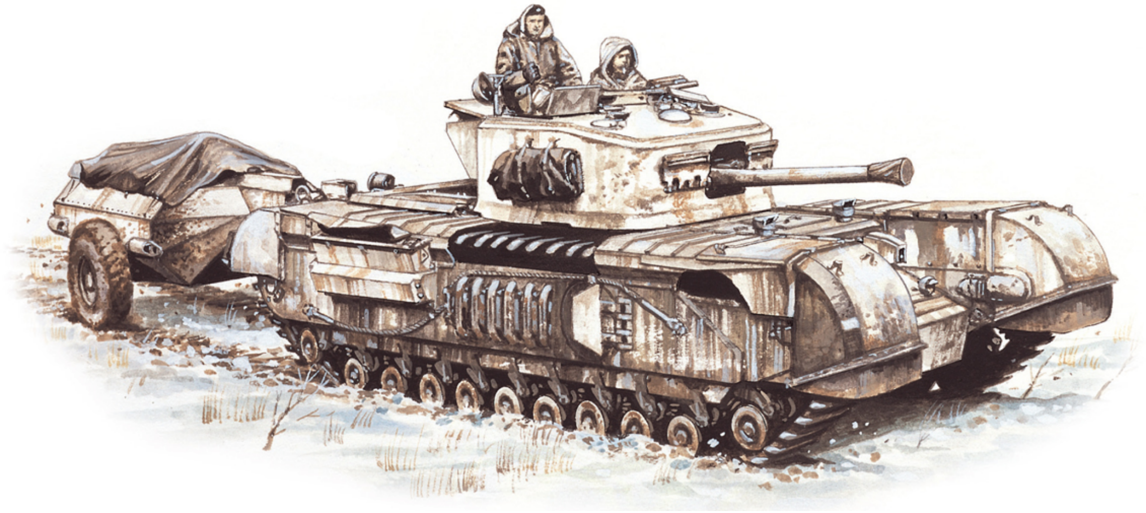
Effective range: 100.5m (330ft)

TANK DETAILS



CHURCHILL MARK II OKE FLAMETHROWER *BEETLE* OF 8 TROOP, B SQUADRON, 14TH CANADIAN ARMY TANK REGIMENT, DIEPPE, 19 AUGUST 1942

An early variant of the Churchill flamethrower tank, the Oke mounting the Ronson flame projector, was used to support the Canadian landing at Dieppe in August 1942. Three of the tanks – *Bull*, *Boar* and *Beetle* – were launched, but *Bull* was swamped, *Boar* managed to knock off its armoured fuel tank and so could not use its flamethrower, and *Beetle* successfully got ashore but then broke a track.



CHURCHILL VII CROCODILE, A SQUADRON, 7TH ROYAL TANK REGIMENT, HOLLAND, JANUARY 1945

A Churchill Crocodile tank as used in the fighting for Holland in January 1945. A coat of whitewash has been applied over the top of the camouflage pattern on both the tank and the trailer, though it has already started to wash off this particular tank.

THE M3/M5 STUART LIGHT TANK

The M3 and M5 family of tanks, known to the British as the Stuart, were the first US-built tanks to see active service in World War II. Developed in the 1930s, they were nearing obsolescence by the beginning of World War II but continued to be used in a variety of roles right through to the end of the war in 1945.

During the inter-war years, the US Army paid scant attention to the development of armoured vehicles, investing only in a limited number of combat cars and light tanks. However, France's shock defeat in 1940 provoked the US Army into the realization that its armoured forces were under-equipped for modern combat and required new organization and vehicles. Although medium tanks were what was required, the US armaments industry was not set up to provide them, and so light tanks would have to fill the gap. The M3 light tank was based on the existing M2A4 light tank, but with improved armour protection and a 37mm gun. This was the first US tank to see service, with the first shipment of tanks, now known as the Stuart, reaching British forces in the Western Desert in July 1941 in time for Operation *Crusader*. Their combat performance was mixed, with the crews praising their mechanical reliability and speed, but criticizing the poor armour protection and inadequate main armament. In late 1941 the M3 also saw service with US forces in the Philippines, and it proved better suited to the conditions in the war in the Pacific.

Throughout 1941 and 1942 the M3 went through a series of upgrades, culminating in the M5 light tank, introduced in autumn 1942. The new model had a redesigned hull and was now powered by twin Cadillac engines. By this stage, it was clear that the M3 and M5 series were unsuitable for tank-versus-tank combat, at least in the European and Mediterranean theatres, and they were increasingly used in a reconnaissance role where they could use speed to their advantage. In the Pacific they retained their equality with Japanese armour and remained in use throughout the war.

SPECIFICATIONS

Crew: 4

Combat weight: 12.4 tonnes (13.7 tons)

Power-to-weight ratio: 18.2hp/ton

Overall length: 4.5m (14.8ft)

Width: 2.2m (7.2ft)

Engine: Continental W-670-90A radial 7-cylinder petrol

Transmission: synchromesh, 5 forward, 1 reverse gears

Fuel capacity: 255 litres (56 gallons) internal with two optional 114-litre (25-gallon) jettisonable fuel tanks

Max. speed (road): 58km/h (36mph)

Max. speed (cross-country): 32km/h (20mph)

Max. range: 120km (75 miles)

Fuel consumption: 3.7 litres/km (1.3 gallons/mile)

Ground clearance: 0.42m (1.37ft)

Armament: 37mm M6 gun in M22 combination mount with co-axial .30-cal machine gun and four .30-cal Browning machine guns

Main gun ammunition: 103 rounds of armour-piercing, M51 APC, M63 high-explosive, M2 canister (60 per cent HE, 30 per cent AP, 10 per cent canister)

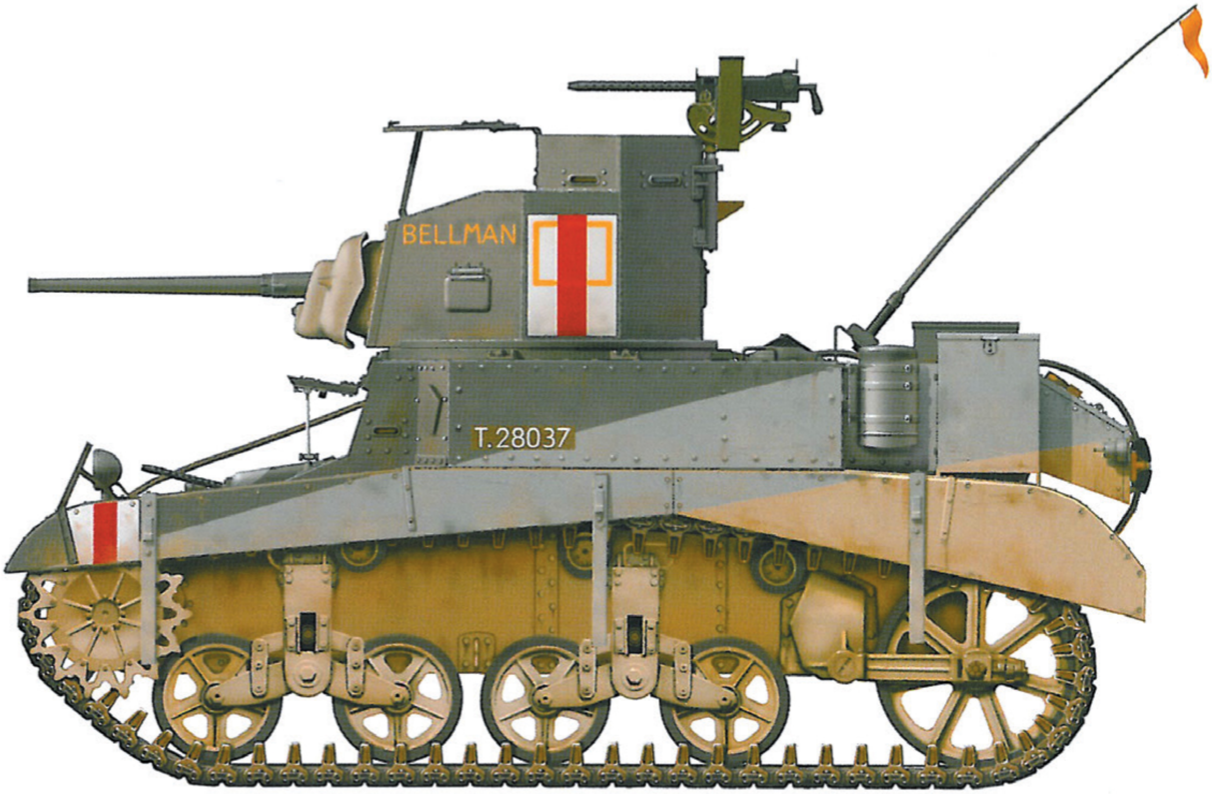
Muzzle velocity: 884m/sec (2,900ft/sec) (M51APC)

Max. effective range: 11.7km (7.3 miles)

Gun depression/elevation: -10 / +20 degrees

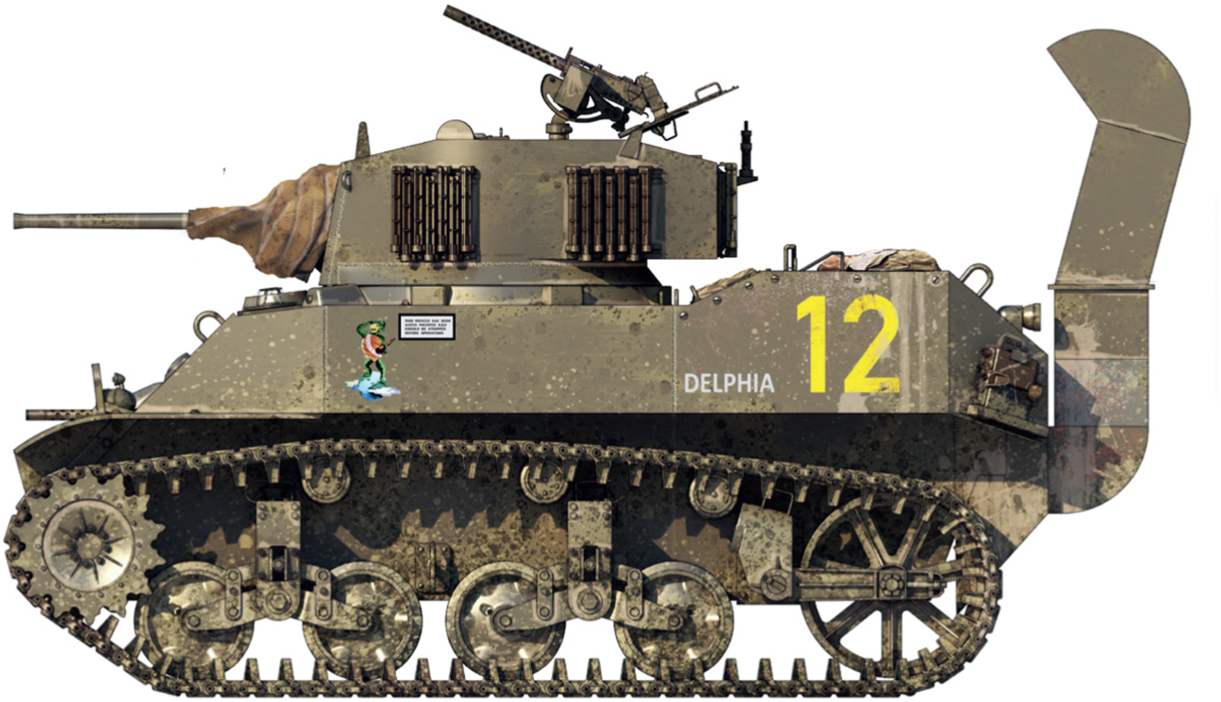
Armour: 51mm (2in) gun mantlet; 38mm (1.5in) turret sides; 38mm (1.5in) hull upper front; 44mm (1.73in) hull lower front; 25mm (0.98in) hull sides

TANK DETAILS



STUART I, 8TH KING'S ROYAL IRISH HUSSARS, 5TH ARMOURED BRIGADE, 7TH ARMOURED DIVISION, OPERATION *CRUSADER*, NOVEMBER 1941

An early M3 Stuart in British service during Operation *Crusader*, November 1941. This tank is camouflaged in the Caunter scheme designed to break up its outline. Stuarts suffered heavily in the *Crusader* fighting, with the 8th Hussars losing 20 of them in their first day of combat on 19 November 1941.



M5A1 LIGHT TANK, UTAH BEACH, 1944

Company D, US 70th Tank Battalion, numbered its tanks on the rear of the hull side rather than the turret. The vehicle name, starting with the company letter, was also carried on the hull side. The ‘Joe Peckerwood’ cartoon was painted on the forward sides of the hull. Behind this on the left side was a paper warning label instructing the crew to remove the waterproofing before operating the tank.

THE M3 LEE MEDIUM TANK

The M3 medium tank was rushed into production in 1941 as a stopgap measure to satisfy the desperate need for a medium tank in US and British tank forces. Its design was a messy stew of outdated inter-war design features and time-saving shortcuts. To its credit, it was one of the best-armed tanks of its day and was based on sound automotive understanding.

The standout characteristic of the M3 medium tank was its rather awkward-looking dual gun arrangement, with the 75mm main gun set in a hull sponson on the side of the tank, and a 37mm gun mounted in a small turret at the top. This made the tank large, high and busy – it had a six- or seven-man crew operating within. But it had decent armoured protection, peaking at 51mm (2in) on the hull front. Two turrets were designed, one at Rock Island Arsenal for the American M3 medium tanks, and one by a British team led by L.E. Carr with a turret radio bustle. The American turret had a fully traversable cupola above the turret armed with a .30-cal machine gun, a feature deemed foolish by the British. In US development, the M3 went through many variations during the war, adjusting elements such as the powerplant, hull construction (welded or riveted) and turret design.

By the time production reached full stride in early 1942, the more mature M4A1 Sherman tank was entering production, which quickly replaced the M3 on the assembly lines. The M3 was ultimately an interim solution until more effective tank designs could be produced. Despite its strange layout and some severe tactical disadvantages, it proved generally effective on the battlefield due to its dual-purpose armament and powerful main gun. Called ‘the tank that surprised Rommel’, it gave a boost to faltering Allied morale just as it seemed that German armour was insurmountably superior to anything the Allies could field. While the M3 disappeared from the tank role in the European theatre by mid-1943, it continued to serve in more distant theatres, and its chassis formed the basis for a number of specialized armoured vehicles, such as the widely used M31 tank-recovery vehicle.

SPECIFICATIONS

Crew: 6–7

Weight: 27.9 tonnes (30.8 tons)

Power-to-weight ratio: 11.3hp/ton

Length: 5.64m (18.4ft)

Width: 2.7m (8.9ft)

Height: 3.10m (10.2ft)

Ground pressure: 0.89kg/cm^2 (12.6psi)

Ground clearance: 0.46m (1.5ft)

Engine: Wright (Continental) R975 EC2; 9-cylinder, 4-cycle, static radial, supercharged petrol

Transmission: synchromesh, 5 forward, 1 reverse

Fuel capacity: 662 litres (175 gallons)

Max. speed (road): 39km/h (24mph)

Cruising range: 190km (120 miles)

Trench-crossing capability: 2.3m (7.5ft)

Fording capability: 0.91m (2.9ft)

Vertical obstacle: 0.61m (2ft)

Armour: 51mm (2in) upper and lower front hull/turret front, sides and rear

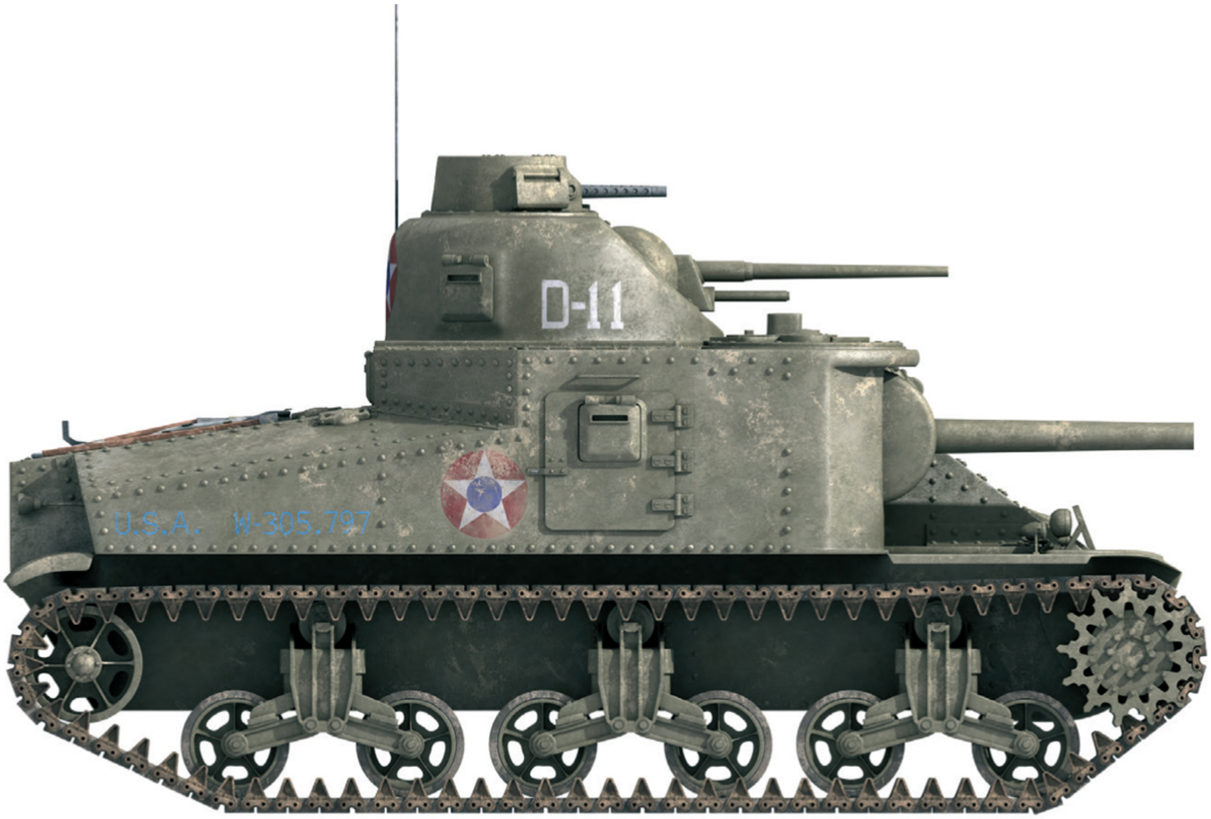
Main armament: 75mm gun M2 or M3

Secondary armament: 37mm gun M5 or M6; 4 × .30-cal M 1919A4 MGs

Stowed main gun rounds: 50 rounds 75mm

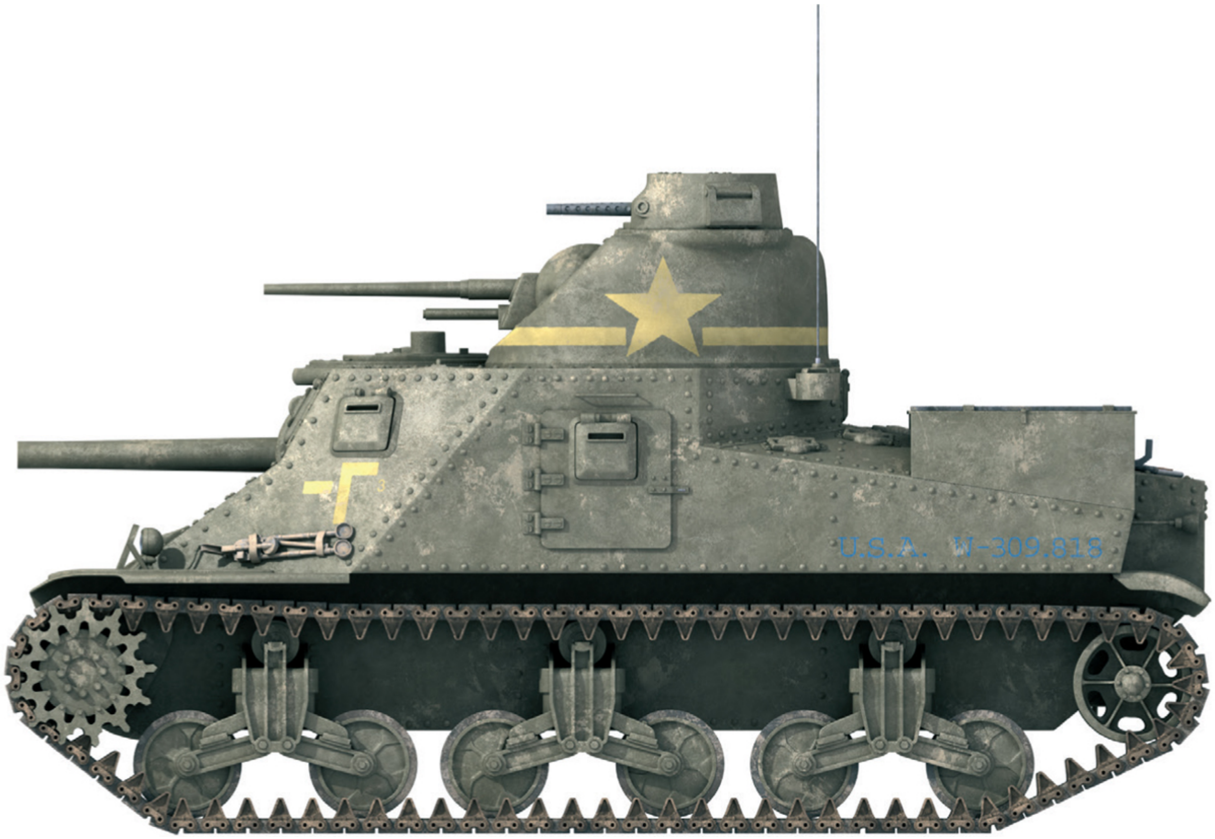
Stowed secondary rounds: 178 rounds 37mm; 9,200 rounds machine gun

TANK DETAIL



M3 MEDIUM TANK, USA, NOVEMBER 1941

US tanks in 1941 were finished in lustreless olive drab paint with blue drab registration numbers painted on the rear sides. The US Army did not employ any form of national insignia prior to 1942, though in the autumn of 1941 some armoured vehicles, including tanks of the 2nd Armored Division, began carrying the Army Ground Forces (AGF) star, which was the same as the Army Air Force (AAF) insignia but with the colours reversed.



M3 MEDIUM TANK, TUNISIA, DECEMBER 1942

In January 1942, the US Armored Force ordered the use of a yellow star and bar insignia, distinct from the white star adopted elsewhere in the Army, to reduce their visibility. Colour film footage of the 2/13th Armored (to which this tank belongs) in Tunisia shows their M3 medium tanks retained these yellow insignia, although many units at the time had reverted back to white for convenience.

THE M4 SHERMAN

Named by the British after a celebrated Union Army general of the American Civil War, Sherman was the generic name for all tanks in the American M4 medium series. Second only to the T-34 (see here) in terms of quantity and longevity of service, it was far more varied than its Soviet contemporary, amounting virtually to five different tanks.

These were: the M4 (British Sherman I), the M4A1 (British Sherman II), the M4A2 (British Sherman III), the M4A3 (British Sherman IV) and the M4A4 (British Sherman V).

These tanks were distinguished primarily by the type of engine fitted. The M4 and M4A1 used the Continental nine-cylinder air-cooled radial as in the M3 Lee/Grant (see here and here), although the M4A1 was easily recognizable by its rounded, cast hull. The M4A2 used twin General Motors six-cylinder diesel engines, the M4A3 a reliable petrol Ford V8 and the M4A4 the troublesome Chrysler multi-bank, a 30-cylinder petrol engine built up from five six-cylinder truck engines all bolted together. All types except the M4A1 had the slab-sided, welded hull. However, in late-production Shermans new hull forms were adopted along with a revised suspension named 'easy-eight'.

In terms of armament, once again there were many variations; the original weapon was the dual-purpose 75mm gun M3, which was perfectly adequate for the proposed role of the tank, although it was later supplemented by a 105mm howitzer for close-support work. To enhance the Sherman's anti-tank capability, a high-velocity 76mm weapon in an enlarged turret was introduced in 1944, while the British managed to squeeze their 76.3mm (17-pdr) gun into the original Sherman turret to create the Firefly (see here).

In addition to its service with the Americans and the British, the Sherman was also supplied in large numbers to the Canadian, South African, French and Soviet armies during World War II. There were many problems with the tank, not least its high silhouette and tendency to catch fire, but its production in huge numbers ensured it was a critical battlefield presence.

SPECIFICATIONS

Crew: 5

Combat weight: 31.5 tonnes (34.8 tons)

Power-to-weight ratio: 12.2hp/ton

Hull length: 6m (19.7ft)

Overall length: 6m (19.7ft)

Width: 2.6m (8.5ft)

Engine: Continental R975-C1 or -C4 9–cylinder radial gasoline engine 350 or 400 hp at 2,400rpm

Transmission: synchromesh, 5 forward, 1 reverse gears

Fuel capacity: 727 litres (160 gallons)

Max. speed (road): 40km/h (25mph)

Max. speed (cross-country): 32km (20mph)

Max. range: 161km (100 miles)

Max. effective range: 1.28km (0.8 miles)

Fuel consumption: 4.5 litres/km (1.6 gallons/mile) (cruising)

Fording capability: 106cm (42in) (without preparation)

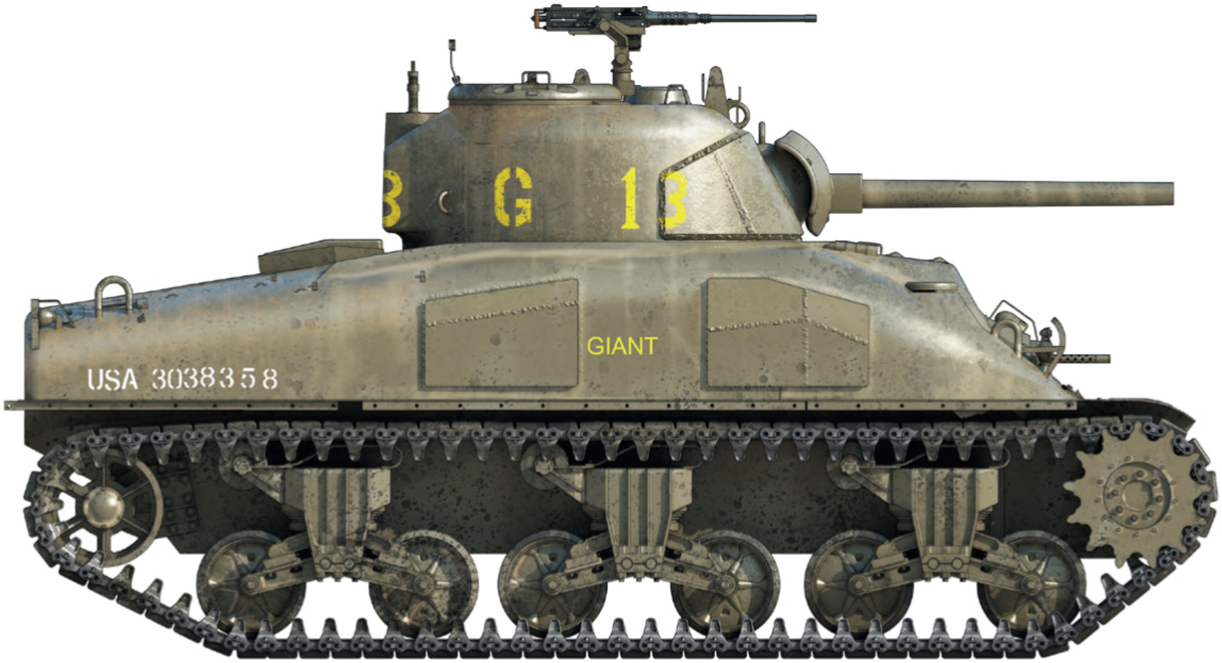
Main gun ammunition: M61 APC, M89 white phosphorous, M48 high-explosive

Armament: 75mm M3 gun in M34 mount

Stowed main gun rounds: 97 M61 APC, muzzle velocity: 618m/sec (2,030ft/sec)

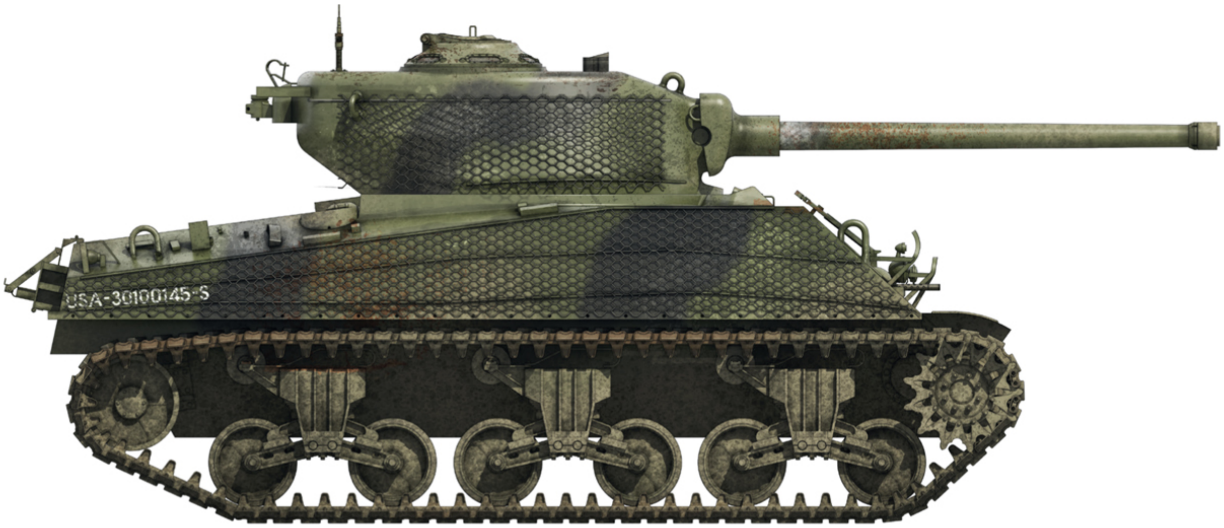
Gun depression/elevation: -12 / +8 degrees

TANK DETAILS



M4A1, US 2ND ARMORED DIVISION, JUNE 1944

While still in training in the UK, the US 2nd Armored Division painted large tactical numbers on the side and rear of its tank turrets in chrome yellow that indicated the company and individual tank number. In this case, it was G-13 with the tank named ‘Giant’ in keeping with the usual practice of using names starting with the company letter.



M4A3 (76MM), US 9TH ARMORED DIVISION, 1944

When the 9th Armored Division arrived in France in November 1944, its tanks were systematically camouflaged by the 602nd Camouflage Engineer Battalion. This consisted of fitting Sommerfeld matting to the side surfaces to permit the attachment of foliage. This particular tank took part in the fighting for Château de Clervaux, where it was knocked out on 17 December. It was subsequently recovered and placed on display by the town as a memorial to the 1944 fighting.

THE M26 PERSHING

Development of the M26 Pershing tank can be traced back to the US T20 medium tank project. This began in May 1942, its aim being to ‘develop a medium tank with increased firepower, armour protection, and maneuverability’ compared with the M4 medium tank. Encounters with the German Tiger tank in Tunisia and Sicily in 1943 convinced the Armored Force of the need for a heavy tank with better armour and firepower. Two designs were examined, the T25 with 76mm (3in) frontal hull armour and the T26 with 102mm (4in) hull armour, both fitted with a powerful 90mm gun. After a protracted and often controversial period of development, the T26E3 was finally declared to be battleworthy on 20 January 1945 and standardized on 29 March as the M26 heavy tank.

The Pershing had a five-man crew. The tank commander’s station was on the right side of the turret with two seats, one at turret-race level for riding inside the tank and a folding seat on the turret wall for riding outside the cupola. The tank was armed with a 90mm M3 gun that had a very similar performance to the German 88mm KwK 36. The gunner sat immediately in front of the commander in the turret on the right-hand side, and sighted the gun via an M10F periscope in the roof with an integral telescope, plus a co-axial M71C telescopic sight. The unitary periscope was an advantage, since it allowed the gunner to maintain situational awareness while the tank was travelling by observing the terrain and looking for targets. In terms of mobility, at least by American standards, the Pershing was considered underpowered, since it used essentially the same engine as the M4A3 medium tank, a vehicle that weighed nearly 9 tonnes (10 tons) less.

The Pershing was roughly equal to the mighty German Panther or Tiger tanks, but it arrived too late to have much impact on the fighting in the European Theater of Operations (ETO). In terms of long-term influence, however, the M26 was the forerunner of a family of US tank designs including the M46, M47, M48 and M60 that formed the core of the US tank force for a half-century through the Cold War.

SPECIFICATIONS

Crew: 5

Weight: 41.8 tonnes (46 tons)

Overall length: 8.54m (28.02ft)

Width: 3.51m (11.52ft)

Height: 2.78m (9.12ft)

Trench-crossing capability: 2.4m (7.87ft)

Fording capability: 1.2m (3.94ft)

Step climbing: 1.2m (3.94ft)

Ground clearance: 40.6cm (16in)

Ground pressure: 0.91kg/cm^2 (13psi)

Engine: Ford GAF; 8-cylinder petrol 450–500hp at 2,600rpm

Transmission: Torqmatic, 3 forward, 1 reverse

Fuel capacity: 693 litres (183 gallons)

Max. speed (road): 32km/h (25mph)

Max. range: 160km (99 miles)

Armour: 10mm (4in) upper hull; 76mm (3in) lower hull/turret sides; 50–75mm (2–3in) hull sides

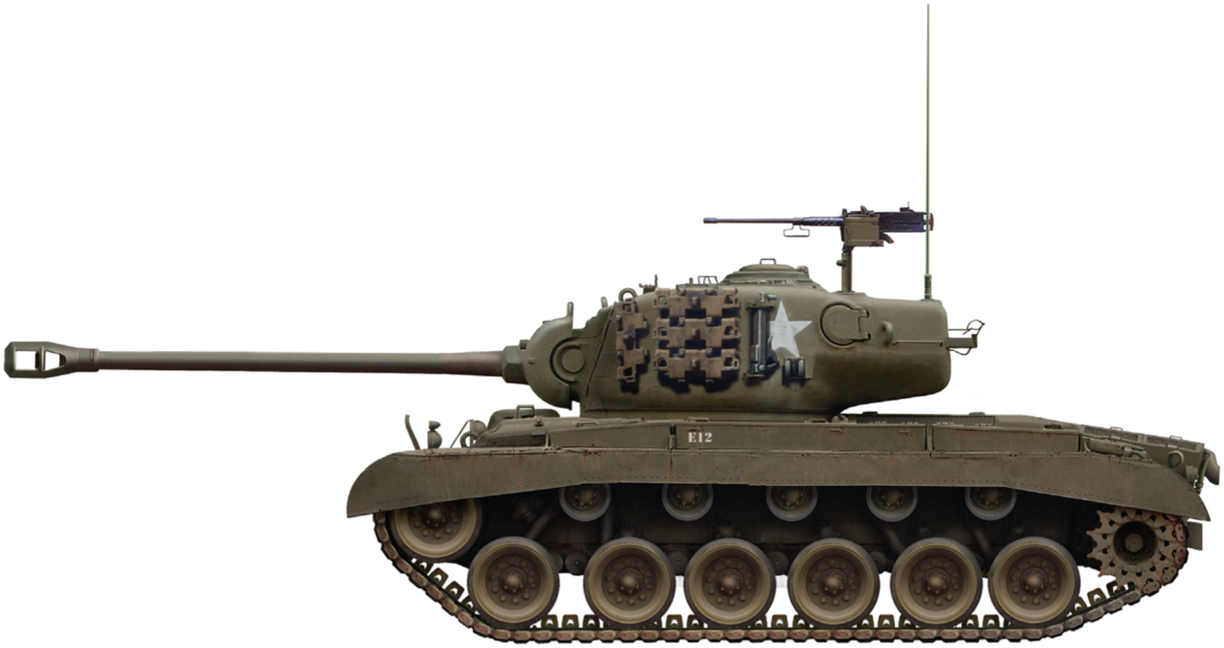
Main armament: 90mm gun M3

Secondary armament: 1 × .50-cal M2HB MG; 2 × .30-cal M1919A4

Stowed main gun rounds: 70

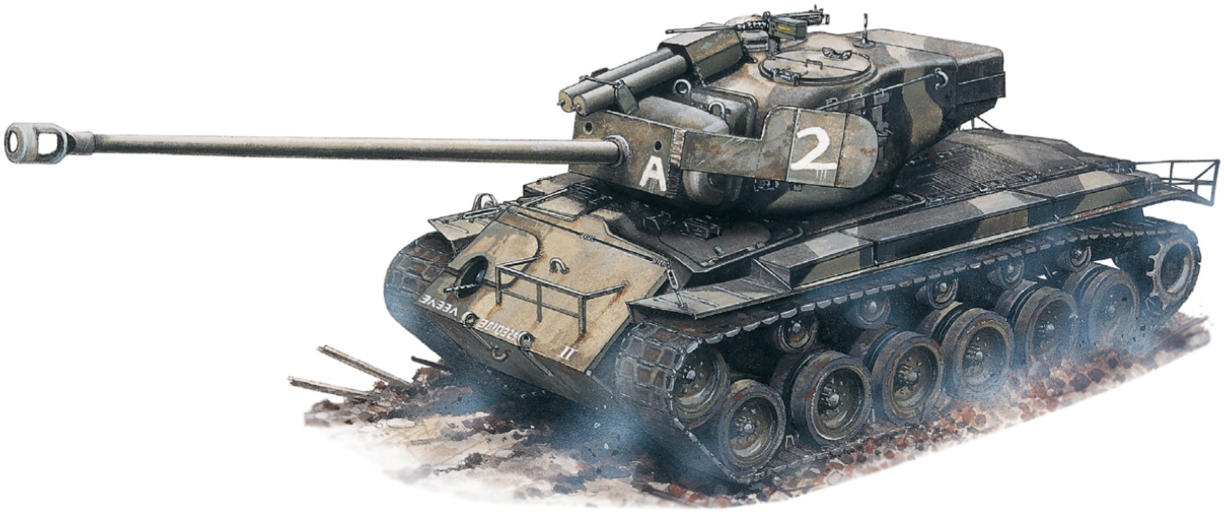
Stowed machine gun rounds: 550 rounds. 50-cal; 5,000 rounds .30-cal

TANK DETAILS



T26E3 PERSHING, 1945

By the summer of 1944, reports of widespread encounters with the well-armed Panther tank in Normandy largely focused US efforts on developing the T26E1. With the various improvements prompted by the Aberdeen Proving Ground trials, the reconfigured tanks were designated as T26E3. The T26E3 entered production in November 1944, and by February 1945 it was on operational service in the ETO. It became the M26 the following March, named after General John J. Pershing.



T26E1 SUPER PERSHING, GERMANY, MARCH 1945

In mid-March 1945, an additional T26 arrived in Germany, fresh from gunnery trials in the United States. This was the sole example of the so-called ‘Super Pershing’ to see combat – an original T26E1 pilot tank which had been re-armed with a new long-barrelled T15E1 90mm gun that was designed to offer performance comparable to the German 88mm KwK 43 on the King Tiger.

THE SHERMAN DD AMPHIBIOUS TANK

Sherman DD (Duplex Drive) tanks, or 'Swimming Shermans', were a key part of the operational plan for D-Day, as it was thought vital to have armoured support for the infantry on the beaches. These vehicles were designed to 'swim' under their own power from craft off the shore in order to land alongside the first waves of infantry.

The efforts to develop a tank with an amphibious capacity had started in the pre-war years, but it was the work of one man – Nicholas Straussler – that revolutionized the field. Working originally with British tank designs such as the Tetrarch and the Valentine, Straussler decided to retain the original tank largely unmodified and construct a waterproof canvas screen around the upper half of the tank, creating a canvas hull and improving the vehicle's buoyancy. The tank was then driven through the sea by the use of propellers powered by the main engine.

In 1943 the Sherman tank replaced the British types in the DD programme, and by the time of the D-Day landings five British and Canadian armoured regiments and three US tank battalions were equipped with different variants of the Sherman DD.

The performance of the 'Swimming Shermans' on D-Day itself was mixed; the British 13th/18th Hussars off Sword Beach landed 31 out of the 34 tanks they launched, while off Gold Beach the Sherwood Rangers lost eight tanks, and the 4th/7th Dragoon Guards never got to test the sailing qualities of their tanks as their LCT ran them all the way in. The Canadians off Juno Beach saw 21 out of 29 make it to the shore, while the US 70th Battalion off Utah Beach only lost one tank on the way in. However, off Omaha Beach it was a different story, with only two out of the 29 tanks of the 741st Battalion making it to the shore. Swimming Shermans were used again in the campaign in Northwest Europe, both in operations in the Scheldt Estuary, and in the crossing of the rivers Rhine and Elbe in Germany.

SPECIFICATIONS

Crew: 5

Power-to-weight ratio: 10.7hp/ton

Combat weight: 34.4 tonnes (38 tons)

Overall length: 7.31m (24ft)

Overall width: 3.2m (10.5ft)

Overall height (screen raised): 3.8m (12.5ft)

Ground clearance: 20cm (7.9ft)

Engine: General Motors 6046, 12-cylinder twin-in-line diesel, 410hp at 2,900rpm

Transmission: five-speed and reverse gears, controlled differential steering

Max. speed (land): 48km/h (30mph)

Max. speed (water): 8km/h (5mph)

Max. range: 241km (150 miles)

Armament: 75mm M3, two M1914 .30-cal Browning machine guns

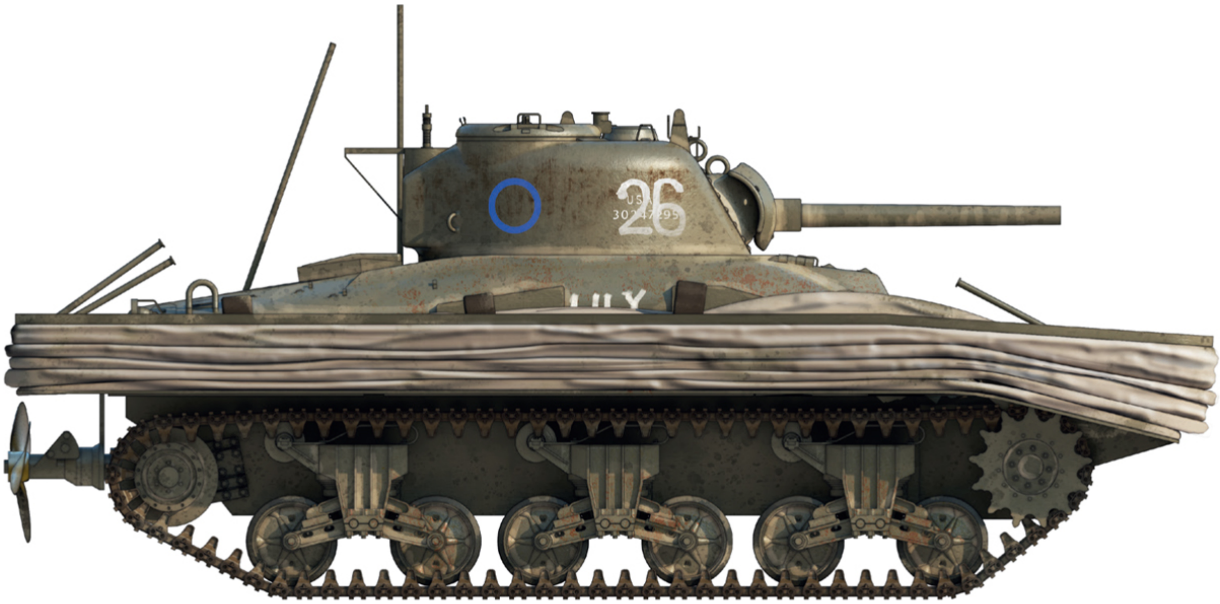
Muzzle velocity: 618.7m/sec (2,027ft/sec)

Max. effective range: 9.7km (6 miles)

Ammunition: 97 rounds

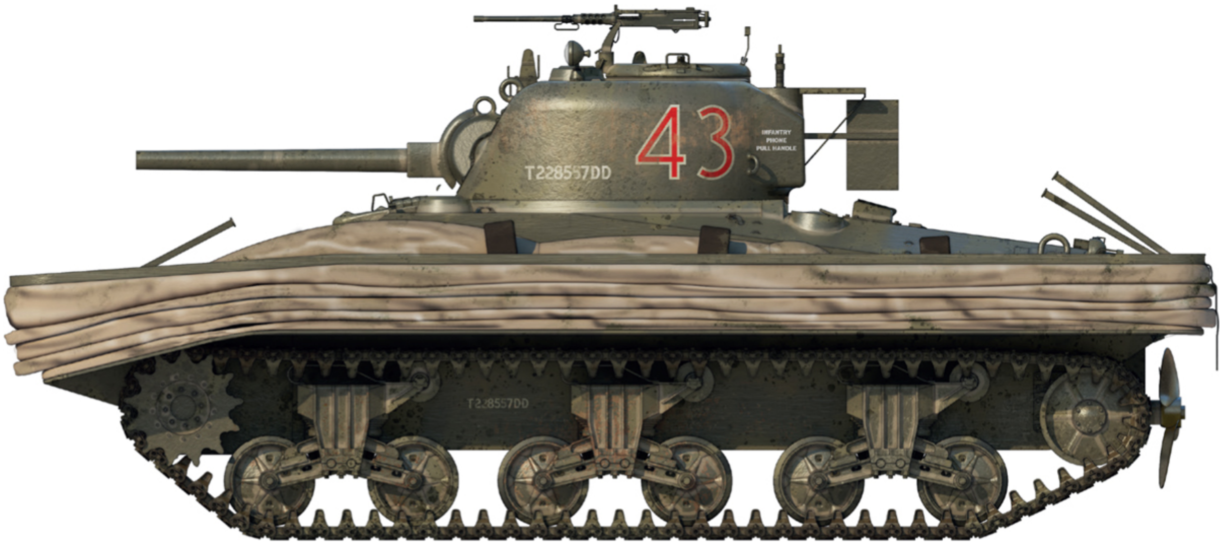
Gun depression/elevation: -10 / +25 degrees

TANK DETAILS



SHERMAN II (M4A1) DD TANK, GOLD BEACH, 1944

The 8th Armoured Brigade received its DD tanks from the American batches, as seen here. These arrived only in May 1944, so the usual British fittings such as the stowage boxes on the turret rear were absent from these tanks. There are still the remnants of a US Army registration number under the tactical number ‘26’ on the turret, which would suggest that this tank is finished in US olive drab rather than its similar British counterpart, SCC 15.



SHERMAN V DD TANK, SWORD BEACH, 1944

On D-Day, each British armoured brigade had two squadrons with about 40 DD tanks to spearhead the landings ahead of the lead infantry waves. The 13th/18th Hussars used sequential numbers for its turret tactical numbers: 10–20 (HQ Squadron); 22–36 (A Squadron); 43–58 (B Squadron); and 66–80 (C Squadron). Since the census number would not be evident on the hull side, it was painted low on the turret side. The Allied Star insignia was painted on the turret roof (not visible here).

THE M24 CHAFFEE LIGHT TANK

The M24 Chaffee entered service with the US Army towards the end of World War II, replacing the outdated M3 and M5 series of light tanks. In the short time it saw combat in the war it proved to be an excellent design and went on to see widespread use throughout the world in the post-war era.

One of the main problems with the M3 and M5 light tanks was that they lacked a suitable main armament, mounting only a 37mm gun. So when the M24 was developed it was equipped with a 75mm weapon, which in turn meant that the armour was kept light in order to keep to a weight limit of 18.14 tonnes (20 tons). The power train was very similar to that used in the M5A1, with only minor alterations. Developed throughout 1943, the tank went into production in April 1944, and the first batch of M24s arrived in France in early December 1944, just in time to take part in the Battle of the Bulge. Only two Chaffees actually took part in the battle; they were attached to the 740th Tank Battalion.

The new tank made an immediately favourable impression, with its mobility and main gun being praised, though tankers had reservations about its level of armour protection, and it was clear that the tank was not suitable for use against enemy armour. As a result it was used primarily in a reconnaissance role.

By the end of the war just over a third of US light tanks were M24 Chaffees, while a significant number were also used by the British. Priority for the M24 went to the cavalry reconnaissance squadrons, though the M24 was also issued to the armoured divisions and separate tank battalions as they became available. The Chaffee was arguably the best light tank of World War II, although the Stuart was the most common light tank in service, primarily the Stuart V (M3A3) and Stuart VI (M5A1).

SPECIFICATIONS

Crew: 5

Combat weight: 18.3 tonnes (20.2 tons)

Power-to-weight ratio: 14.6hp/ton

Overall length: 5.5m (18ft)

Width: 2.98m (9.8ft)

Height: 2.77m (9.1ft)

Engine: two Cadillac 44T24 8-cylinder, 4-cycle engines, 148hp each at 3,200rpm

Transmission: Hydramatic with four speeds

Fuel capacity: 500 litres (110 gallons)

Max. speed (road): 56km/h (35mph)

Max. speed (cross-country): 32km/h (20mph)

Max. range: 161km (100 miles)

Fuel consumption: 3.1 litres/km (1.1 gallons/mile)

Ground clearance: 46cm (18in)

Armament: 75mm M6 gun in M64 mount; .30-cal machine gun; two .30-cal machine guns

Main-gun ammunition: 48 rounds 75mm; 440 rounds .50-cal; 3,750 rounds .30-cal

Muzzle velocity: 6,197m/sec (2,030ft/sec) (M61APC)

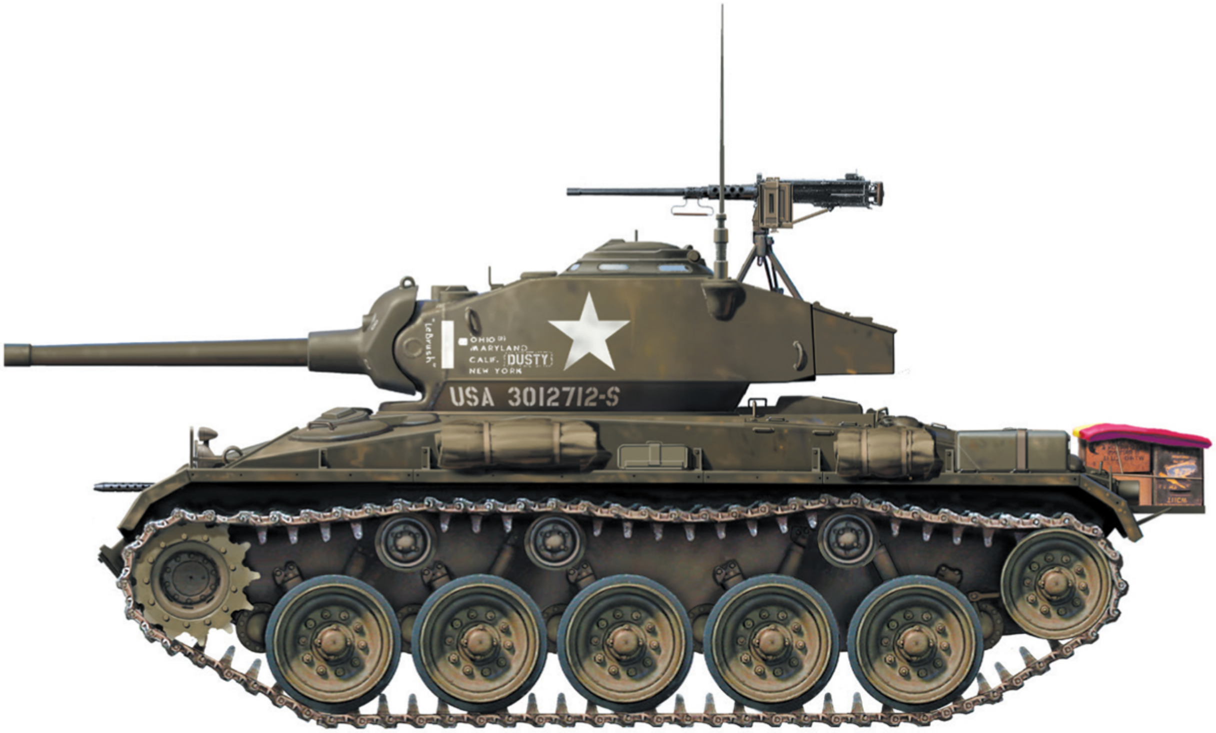
Penetration: 66mm at 500yds at 30 degrees obliquity

Max. effective range: 12.8km (8 miles)

Gun depression/elevation: -10 / +15 degrees

Armour: 38mm (1.5in) gun mantlet; 25mm (0.98in) turret sides; 25mm (0.98in) hull upper front, lower front, sides

TANK DETAILS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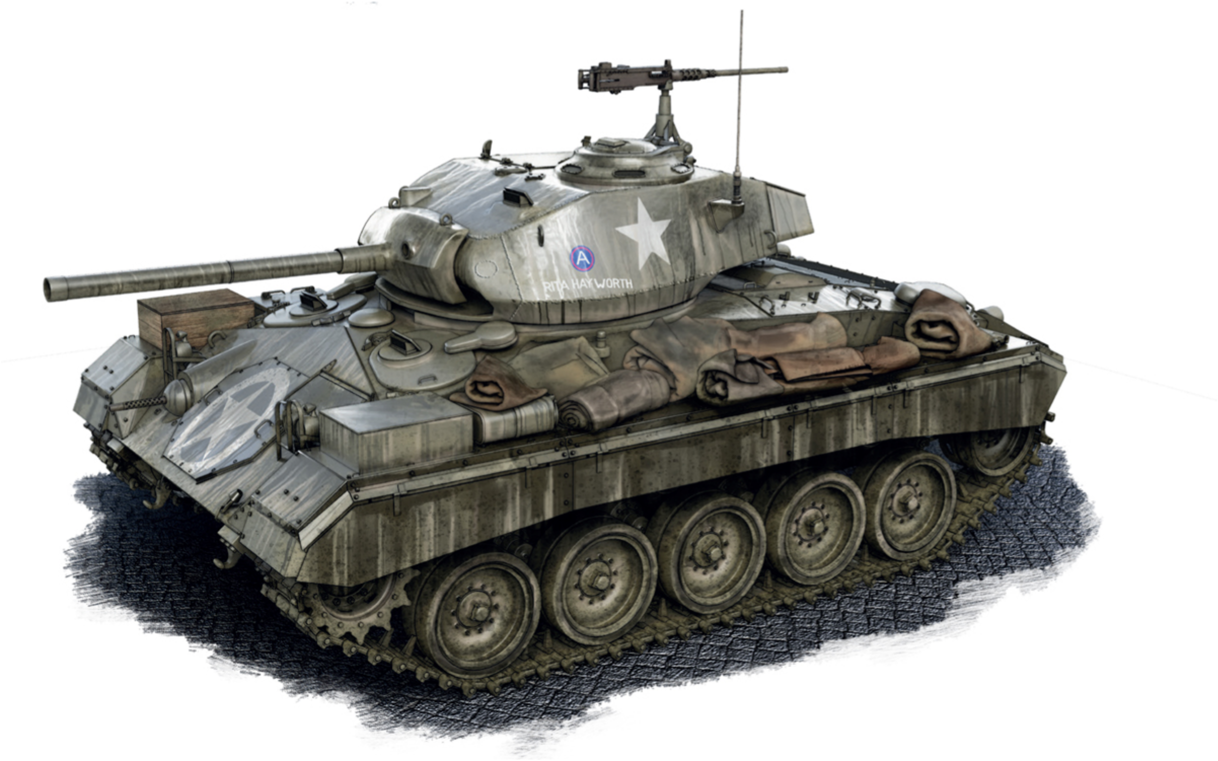
M24 LIGHT TANK, COMPANY D, 36TH TANK BATTALION, 8TH ARMORED DIVISION, RHEINBERG, GERMANY, MARCH 1945

An M24 Chaffee with typical late-war US markings and painted in lustreless olive drab. This particular vehicle was knocked out during the fighting for the German town of Rheinberg on 3 March 1945, when Company D lost 17 out of its 18 M24s in the battle for the heavily defended town.



M24 LIGHT TANK, GERMANY, APRIL 1945

The M24 Chaffee first saw combat use around Christmas 1944 in the Ardennes, but then fought its way into the heart of the Reich itself. This tank is named after the famous movie star Rita Hayworth, and it is finished in the usual overall lustreless olive drab. This unit, which was attached to Patton's Third Army, painted the Third Army insignia on their turret during the final weeks of the war, a blue disc with red trim and a white letter A.

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CONVERSION TABLE

1 millimetre (mm)	0.039 in
1 centimetre (cm)	0.394 in
1 metre (m)	1.094 yards
1 kilometre (km)	0.621 miles
1 kilogram (kg)	2.205 lb
1 inch	2.54 cm
1 foot	0.305 m
1 yard	0.914 m
1 mile	1.61 km